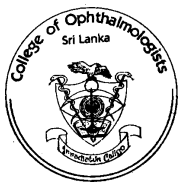
JOURNAL OF THE COLLEGE OF OPHTHALMOLOGISTS OF SRI LANKA

VOLUME 23 No. 1 2017

- IDIOPATHIC JUXTAFOVEAL TELENGIECTASIA – OCT ANGIOGRAPHIC FEATURES IN DEEP RETINA
- THE PUPILLARY ILLUMINATOR

College of Ophthalmologists of Sri Lanka Annual ISSN 2345-9115



Journal of The College of Ophthalmologists of Sri Lanka

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Sri Lanka.

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Printed by

Ananda Press
277, Hokandara Road, Thalawathugoda,
Sri Lanka.
Tel: +94 11 2774793
E-mail: anandapress@ymail.com

Journal of the College of Ophthalmologists of Sri Lanka is published annually in two volumes. It is clinically oriented, designed to keep ophthalmologists up to date. It contains peer reviewed articles, current research, case presentations and clinical challenges.

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JOURNAL OF THE COLLEGE OF OPHTHALMOLOGISTS OF SRI LANKA

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Journal Articles

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2. Smith JD, Jones TS. Ophthalmology and society. *Surv Ophthalmol* 1997; **42**: 65-78.

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Chapters

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JOURNAL OF THE COLLEGE OF OPHTHALMOLOGISTS OF SRI LANKA

VOL. 23 2017 NO. 1

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Editorial

Vision for the College

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23:1

To promote the continuing progress of Ophthalmology throughout the country is one of the aims of the College.

The College has to play an essential role in defining current best practices and has great potential to influence policies that will raise the standard of care for our patients.

The College will continue to expand the scope of its activities, which encompass education and debate as well as research.

Education has always been our primary aim and it shall continue to be so in the future.

Quality of the programme in our congress has improved dramatically over the last years and it has made huge effort to offer a format for promoting the exchange of ideas. The programmes dedicated to the education of young ophthalmologists have brought a fresh air to the organisation and brought the College closure to fullfilling the expectation of young members.

One big challenge over the next few years will be to ensure that we will meet the requirements of the new regulations regarding industry support.

The College taking on an important role in research, organizing multicenter studies and epidemiological studies about hot topics and to define what is the state-of-the-art based on evidence.

There are many things College can do to provide better recognition of new diagnostic technologies and treatment options which will benefit both the patients and industry.

Another direction that can be further developed is in strengthening our links with the developing world.

Jt. Editors

Presidential Address 2016

Eye health and the sustainable development goals

Pradeepa K. Siriwardena[1]

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 2-7

My speech today is about how meeting the challenges for the sustainable Development Goals (which are the new goals recommended by the United Nations aimed at alleviating poverty), will inevitably bring optimal and promising eye health.

The year 2016 is the year that the College is celebrating its 25th Anniversary. It is the year from which the United Nations is planning to lay down its new framework for poverty alleviation with the Sustainable Develop-ment Goals.

Sustainable development is, development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The Sustainable Development Goals are ambitious and targeted agenda for alleviation of poverty and esta-blishing a world of universal respect for human rights and dignity. They are innovative, universal, short goals that succeeded the Millennium Development Goals.

In September in the year 2000, the world leaders gathered at the United Nations Headquarters to develop an agenda to combat poverty.

This was transferred into 8 Millennium Development Goals providing a blue print to reduce extreme poverty from the year 2000 up to the year 2015.

These goals were in the areas of poverty alleviation, education, gender equity, improving maternal and child health, combating infectious disease and ensuring environmental sustainability and global partnership.

The Millennium Development Goals have been highly successful in raising visibility and consolidating the world's commitment to poverty reduction through a cohesive approach to development.

Despite the worldwide traction towards achieving the Millennium Development Goals, progress remains unequal leaving challenges behind.

The learning from them forms a strong basis for moving forward. The Sustainable Development Goals must now work to strike a balance between the ambitious and the practical.

Sustainable Development Goals

The Sustainable Development Goals are set to become the new framework of poverty relief and reducing inequality. United Nations membership is expected to use them to frame their agendas and policies over the next 15 years to year 2030 starting from January 2016.

These goals will be relevant to everyone including governments, academia and civic societies; fostering genuine engagement and cross sector collaboration.

The foremost component of the new development agenda is that the sustainable Development Goals have a comprehensive focus on economic prosperity, social inclusion and environmental sustainability.

Unlike the Millennium Development Goals which are only applicable to developing; they are anticipated to apply for all countries.

[1]*Consultant Eye Surgeon – President, College of Ophthalmologists of Sri Lanka, 2016.*

Eye health and the sustainable development goals

It is essential that the eye health sector will follow the Sustainable Development Goals to impart to the elimination of avoidable blindness and vision impairment and promote full participation of people who are blind and visually impaired in the community. While health is identified as one of the 17 Sustainable Development Goals (Goal 3 "Ensure healthy lives and promote wellbeing at all ages"); thematic links can be drawn to other goals relating, to poverty alleviation, nutrition, education, gender equity and; water and sanitation.

Poverty and vision impairment

Vision impairment is both a cause and a consequence of poverty.

Preventing avoidable blindness has a crucial role to play in reducing poverty and can make a definite impact on the community and on the overall effort to achieve the Sustainable Development Goals.

Direct links exist, between vision impairment and lack of access to basic needs such as health, good nutrition, safe housing, clean water and sanitation; and to opportunities such as education, employment and social inclusion.

Globally, the prevalence of vision impairment is fivefold high in developing countries than developed countries; and eye health care is an important factor in working towards poverty alleviation.

The relationship between poverty and visual impairment can be understood as involving mutual causality, with vision impairment presenting barriers to poverty reducing factors such as education and employment, and poverty making it difficult for people to gain access to eye care services.

Eye health programmes are effective and produce tangible results. For many individuals productivity gains are immediately realized once the sight is restored.

Poverty and disability

It is estimated that people living with disability make up to 15% of the global population, yet they often remain unintentionally excluded from social and political decision making.

The strong correlation between poverty and disability perpetuates a cycle in which disability is both a cause and a consequence of poverty.

Recent World Bank estimates suggest that people with disability may account for as many as one in five of the world's poorest people; who are often excluded from community, education, public health services and development programmes.

Disability contributes to and excavates poverty, at both individual and community level; due to discrimination and entrenched institutional and social barriers.

An individual with a disability is less likely to have access to rehabilitation, education, skills training and employment; all which function to lessen poverty.

The inclusion of people with disability across all sectors of international development is important to break the cycle. Empowering people with a disability to obtain education and access to health and rehabilitation services, and to participate fully and independently in society is essential.

Eye health and nutrition

Links could be drawn between poor nutrition and visual impairment. The eye diseases that could be linked to nutrition are vitamin A deficiency and Retinopathy of Prematurity.

Vitamin A deficiency

Vitamin A deficiency is the leading cause of preventable childhood blindness; and approximately 250,000 to 500,000 malnourished children in the developing world go blind each year, from a deficiency of vitamin A, approximately half of whom die within a year of becoming blind. It also contributes to maternal mortality and other poor outcomes in pregnancy and lactation.

Vitamin A deficiency also diminishes the ability to fight infections. In countries where children are not immunized, infectious diseases like measles have higher fatality rates and even mild, subclinical deficiency can also be a problem, as it may increase children's risk of developing respiratory and diarrheal infections, decrease growth rate, slow bone development, and decrease likelihood of survival from serious illness.

The management of Vitamin A deficiency is a large and complicated public health challenge specifically in developing countries. Breaking the cycle of poverty and malnutrition is the key to this.

Retinopathy of prematurity

Retinopathy of prematurity is an important cause of avoidable childhood blindness in industrialized

countries. It is also emerging as a problem in economically developing parts of the world because of the ever increasing survival of low, and very low birth weight infants. It is a disease that effects the immature vasculature of the eyes of premature babies, and its incidence is inversely proportional to the birth weight.

Poor maternal health and malnutrition is directly responsible for intrauterine growth retardation and premature birth. Lack of access to basic needs during pregnancy such as health services and good nutrition are contributory factors.

One of the aspects of reducing the burden of Retinopathy of Prematurity; is its prevention through poverty reduction and increased access to basic needs and services during, and after pregnancy. Screening babies who are at risk and early intervention is also necessary.

Blindness occurring in infancy is a long-lasting burden, both in terms of social dependence and lost productivity. Therefore, a public health intervention that saves the sight of even a relatively small number of infants and children; provides significant savings, while ensuring a better quality of life for those affected.

The treatment of Retinopathy of Prematurity is laser; which is highly specialized requiring expensive equipment and highly trained staff.

Increasing the capacity of the workforce through health system strengthening and training will have a tremendous implication in reducing the burden of Retinopathy of Prematurity

Neglected tropical diseases

Communicable diseases such as Neglected Tropical Diseases, as well as Non communicable diseases are responsible for visual impairment.

Neglected Tropical Diseases are a diverse group of communicable diseases, that prevail in tropical and subtropical conditions in countries, and affect more than one billion people, costing developing economies billions of dollars every year. They mainly affect populations living in poverty, without adequate sanitation and in close contact with infectious vectors and domestic animals and livestock.

Their impact on individuals and communities is devastating. Many of them cause severe disfigurement and disabilities, including blindness.

Neglected Tropical Diseases coexist with poverty, because they thrive where access to clean water and sanitation is limited, and people live without protection from disease vectors. They also are recognized as a contributor to poverty, since they can impair intellectual development in children, reduce school enrollment and hinder economic productivity, by limiting the ability of infected individuals to work.

The diseases related to the eye health are Trachoma and Onchocerciasis.

Trachoma

Trachoma is the leading cause of infective blindness in the world; and Africa remains the most affected continent. It is an infection of the eyes that may result in blindness after repeated infections. It occurs where people live in overcrowded conditions with limited access to water and health care. Infection usually first occurs in childhood but people do not became blind until adulthood.

Trachoma is frequently passed from child to child, and from child to mother within the family.

Rate of trachoma is known to be higher in women than in men. As women and girls are primary childcare providers, they acquire the infection from young children.

Elimination of trachoma

The Alliance for the Global Elimination of Blindness from Trachoma by 2020 (GET2020) initiative, supported by the WHO advocates for the implementation of the SAFE strategy

Surgery

Antibiotics

Facial cleaning

Environmental improvement

Onchocerciasis

Onchocerciasis is an eye and skin disease caused by the filarial worm onchocerca volvulus. It is transmitted to humans, through the bite of a blackfly which breeds in fast-flowing water, increasing the risk of blindness to individuals living nearby.

Infection with onchocerca volvulous, causes migration of microfilariae into the eye, causing damage to the critical structures of the eye, and permanent blindness. This disease is prevalent in Africa and Central America. It is one of the main causes of blindness affecting the economically disadvantaged countries and the second most common infective cause for blindness in the world after trachoma. Elimination requires a coordinated, consistent and intensive approach at various levels.

Non communicable disease and eye care

Globally, 80% of blindness and vision loss is preventable and treatable, if detected early enough. Many eye conditions including Cataract, Glaucoma, Diabetic Retinopathy and Age Related Macular Degeneration are classified as chronic or Non Communicable Disease. Poverty is closely linked to Non Communicable Disease.

Over the last two decades, these Non-Communicable eye diseases have become much more significant due to following factors.

As a result of health care initiatives, the proportion of people blind due to infectious eye diseases, has decreased dramatically from 20% to 2% over the last three decades; while the proportion due to other eye conditions including Non-Communicable eye diseases, has increased.

People are living longer, and the change in their diet and lifestyles has led to an increase in Non-Communicable eye diseases.

Cataract

Cataract is the leading cause of blindness in the world, responsible for 48% of the world blindness. Most cases of cataract are related to the process of aging, and other risk factors including diabetes mellitus, prolonged exposure to sunlight and the use of tobacco and alcohol.

Fortunately, cataract can be easily treated, and surgically removed. Cataract surgery is considered as one of the most effective interventions.

However in many countries, particularly those in the developing world, barriers exist that prevent equitable access to care.

Cataract surgical rate

Cataract surgical rate is defined, as the number of cataracts operated per million populations, per year providing a quantifiable measure of service delivery.

Cataract surgical coverage

Cataract Surgical Coverage indicates, the proportion of vision impaired individuals with bilateral cataracts who were eligible for surgery, and who received it.

It is used, to assess the degree to which, the needs are met by cataract surgical services. At least 85% of coverage is needed ,to meet the needs and the demands of a population.

The cataract surgical coverage is between 1.2 to 1.7 times higher for males than for females in developing countries.

The barriers preventing access of females to eye care include

- Fewer transport options, and restricted social norms surrounding women and travel, decreasing the chances of women traveling to health services.
- Lower education and literacy levels, particularly among elderly women, leading to women been less likely to know about treatment options, and how to access them.
- Less decision making power in the family, affecting women's chances of treatment, as women's health need s are often not a priority.

Service coordination and provision

Despite significant rates of cataract, refractive errors and diabetic retinopathy; eye care services in developing countries remain under resourced.

Workforce capacity building is critical, to the delivery of effective eye care. In Asia and Pacific, there is a vast shortage of personnel trained in eye care; which is having tremendous implications, for the health and well being of millions of people in the region.

The issues are complex, and vary throughout the region. However the two key issues are

- The general lack of infrastructure to provide training
- The lack of quality training

Even in countries having adequate human resources; there may be an uneven distribution of eye care personnel. In these cases, most of the workforce is concentrated in a few facilities; or confined to urban areas. Coordination and planning at local, provincial and national levels is essential, to ensure that existing resources in eye care delivery are operating as efficiently and effectively as possible.

Education and eye health

Education plays an important role in the alleviation of blindness.

An individual with a disability, has less opportunity to formal education; and children with intellectual and sensory disability, are the least likely group to attend school.

The 2007 World Bank Survey conducted in India; found that disability has a stronger association with non enrolment, than gender or socioeconomic status.

There are many reasons, why children living with disability in poverty may miss education.

- Accessibility issues to wheelchair users, or those with mobility restriction.
- Teachers not having tools or training, to help all their students learn.
- Families and communities not understanding the importance of learning life skills, in an educational setting.
- Attitudinal barriers such as practice of labeling, stigmatization and discrimination.
- Where tertiary education is available, students with disability been often restricted in what they allowed to study.
- Families with several children, often giving priority to children without disability.

On the other hand, over hundred million children worldwide, are marginalized from education, including approximately 40 million with some form of disability residing in the Indo Pacific region.

It is emphasized that, for these children with a disability, education has the potential to transform experiences of deprivation, in to opportunities for independent empowerment.

Women and girls with disability, are disproportionately affected by inequality and discrimination.

In low income countries, women who become disabled are at a greater risk of living in extreme poverty; as they are often excluded from education and training; and are less able to work and support themselves.

Inclusive education, is central in promoting fair and equitable societies. It involves creating an environment, in which each child belongs, and in which their individual contribution is valued.

For people who are blind or visually impaired, access to inclusive, designed and assistive technology can work, to ensure access to opportunities in education, rehabilitation, livelihoods and social inclusion.

Gender and eye health

Gender is one of the most significant groupings of social structure, and remains a fundamental determinant of health.

Vision loss undermines gender equity, as women account for approximately 64% of all blind people globally, and in some countries, women and girls are only half as likely as men, to be able to access eye care services.

In addition the obvious social and developmental reasons for tackling inequality, actively broadening the benefits of economic growth to include women and girls, can work to increase the pace of economic progress in developing countries.

However, available evidence suggests, that women in developing countries, face greater barriers in accessing eye care due to cultural, geographical, gender role and cost related factors. Therefore, women with disability, are at far greater risk of social exclusion and abuse, and are affected by double discrimination, on the basis of their disability and gender.

The fact remains, that women of all ages, are more frequently exposed to causative factors such as infective disease and malnutrition, increasing the risk of developing cataract, trachoma and other eye health problems regardless of age.

Equal opportunities for women and girls

The lack of strong female role models in local and national governments across the world; is connected with social norm, that exist to dictate a woman's role; effectively reducing their chance of leadership, and their chance at increased economic opportunity.

It has been highlighted that women with disabilities are frequently denied equal access to labor forces. According to United Nations reports, less than 25% of females with disability, are in employment; though the majority contribute significantly, to their families and communities, and this goes unrecognized.

Though women's participation, leadership and voice will not increase at the same rate as economic development, economic participation is a necessary precondition, for increased levels of female leadership and voice.

The promotion of gender equity, has had widespread implications, for the economic and social development of individuals, communities, nations and the world; in eliminating avoidable blindness.

Eye health programmes are effective means of reducing the gender gap; by including economic opportunity, through providing access to health services, education and therefore the voice of women in society.

With attainment of right to sight through access to eye care services, women and girls have increased access to education, better health outcomes, and can contribute more to the community economically, socially and culturally; leading to their meaningful empowerment. Social and cultural barriers can mean that women; even more so women from ethnic minorities, particular castes and women with disability such s blindness or low vision; have limited legal rights, lack of opportunities

for education and training, productive employment and limited access to sources such as land and credit.

For example, a woman or a girl living with a disability, is less likely to be employed than a man with disability, and less likely to be employed than a woman without a disability.

Lack of accessibility, due to non inclusive infrastructure, transport and education is compounded by, community and employer perception, that women with disability are unable to work, and contribute to the society. This then has economic consequences to the individual, their family and the community.

Evidence suggests, that barriers to women's economic opportunities vary, but can include a gender inequality in household decision making; prioritization of formal and vocational education for male over females; lack of ownership over money (including money earned by women) and lack of support to local business.

Access to clean water and equitable sanitation

Water and hygiene for all, is integral in eliminating avoidable blindness, and ensuring the full participation of people who are visually impaired, in the community; particularly women and girls, and those in vulnerable situations

Neglected tropical diseases such as trachoma, disproportionately affect populations, where inadequate personal hygiene, insufficient housing and sanitation, crowded living conditions and poor water supply are prevalent.

Meaningful employment

Work is the cornerstone of social inclusion. It generates wages, less reliance on welfare and dignity and a sense of purpose and productivity.

There are a number of barriers, known to have contributed, to the inability to find long term, well paid and meaningful employment for people with visual impairment

- Pre conceived ideas about what people who are visually impaired can and cannot do
- The effort and perceived cost of having a person with disability in employment
- Accessibility of worksite and process
- Position description which indirectly discriminates
- Access to work experience
- Community barriers which compromise access to employment

Access to public places

People who are blind or visually impaired, are continuously faced, with issues relating to, access to public environment, including the access to health services.

Public spaces are designed, without taking into consideration, of the needs of the blind or the visually challenged.

This effectively shuts them out of participating in any activity; that may take place in these spaces including employment, education and other activities in economic, social and political sphere.

Reduced inequalities

In developing equal access to opportunities and effective primary health services; specialized and surgical services, as well as blindness and low vision supportive services, can empower people who are blind or visually impaired, enabling them to better participation in social, economic and political fabric of society on a number of levels.

Ladies and gentlemen,

In concluding my speech, I wish to point out, that although health is only one of the Sustainable Development Goals; the achievement of several other goals, plays a particularly crucial role in the improvement of eye health.

As multifaceted approach is required to achieve the SDGs, the healthcare providers will have to play a vital role in doing so. Sri Lanka's preventive health indicators are impressive. However, as a developing country, it is important to aim for further improvement; to ensure that our policies are satisfied by the SDGs.

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Idiopathic juxtafoveal telangiectasia – OCT angiographic features in deep retina

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The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 8-15

Introduction

Idiopathic Juxtafoveal Retinal Telangiectasia (IJFT) / Macular Telangiectasia (Mac Tel)

Idiopathic juxtafoveal retinal telangiectasia (IJFT) now known as macular telangiectasia (Mac Tel) refers to a heterogeneous group of clinical entities characterized by telangiectatic alterations of the juxtafoveolar capillary network which differ in appearance, pathogenesis, and management. This clinical entity comprises of three types.

Type 1; Congenital and unilateral. Thought to be similar to and/or possibly a variant of Coats disease. This is an uncommon presentation.

Type 2; Acquired and bilateral. The most common form of the three types. Usually found in middle-aged or older patients.

Type 3; Poorly understood primarily occlusive phenomena which is quite rare. This is associated with medical or neurological diseases.

On common usage, the term "Mac Tel" is often used to refer to Mac Tel Type 2. Visual acuity rarely reaches legal blindness in Mac Tel Type 2, but vision can be severely diminished in Mac Tel Type 1 and 3. Mac Tel Type 2 being the commonest presentation, our case discussion is limited to Mac Tel Type 2. According to the Beaver Dam Eye Study, Mac Tel Type 2 has a prevalence of 0.1% with an average age of 63 years. There is a slight female preponderance of 58%.

Pathogenesis

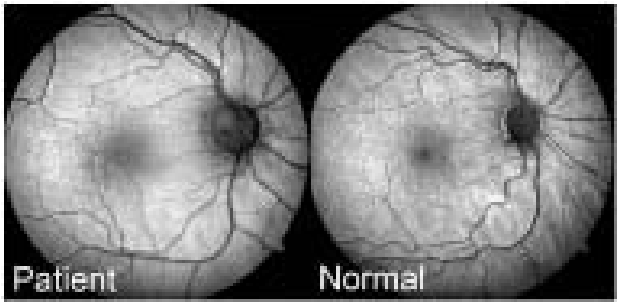
It is initially due to abnormalities or degeneration of Muller cells and parafoveal neurons. The Mac Tel Project found a prevalence of diabetes in 28% and hypertension in 52% in Mac Tel Type 2. Such high prevalence of diabetes, hypertension and the age of onset of the disease point towards a long term vascular stress.

Histopathology has shown disruption of pericytes and ectatic vessels in the deeper retinal layers with evidence of retinal pigment epithelial (RPE) hyperplasia along them. There is evidence of RPE cell migration into the inner retinal layers. Inflammatory changes, neurodegenerative processes and vascular changes are associated with disruption of the outer nuclear layer and ellipsoid zone. Later lead to formation of retinal cysts that can encompass all retinal layers, pseudolamellar macular holes and RPE hyperplasia.

Diagnosis

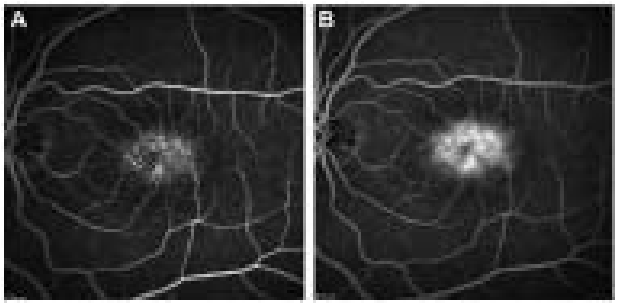
The diagnosis of Mac Tel Type 2 is made by ophthalmic clinical examination. Symptoms and history can help in diagnosis which include metamorphopsia or scotoma. No laboratory test are helpful in diagnosis but ophthalmic imaging such as Fundus Auto-fluorescence, Fundus Fluorescein Angiography, Ocular Coherence Tomography (OCT) and OCT-Angiography (OCTA) are helpful.

Fundus Auto-fluorescence



Decreased fovealhypofluorescence
RPE hyperplasia will appear as hypofluorescent spots

Fundus Fluorescein Angiography



Temporo-fovealtelangiectatic vessels in Mac Tel type 2
Leaks in later stages
Subretinal neovascularization

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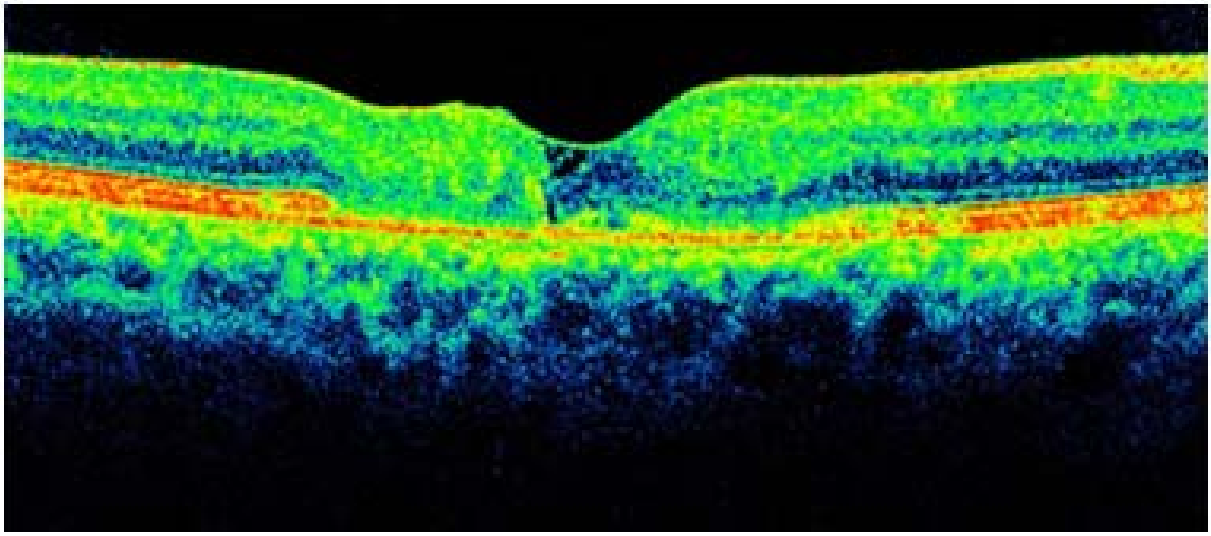
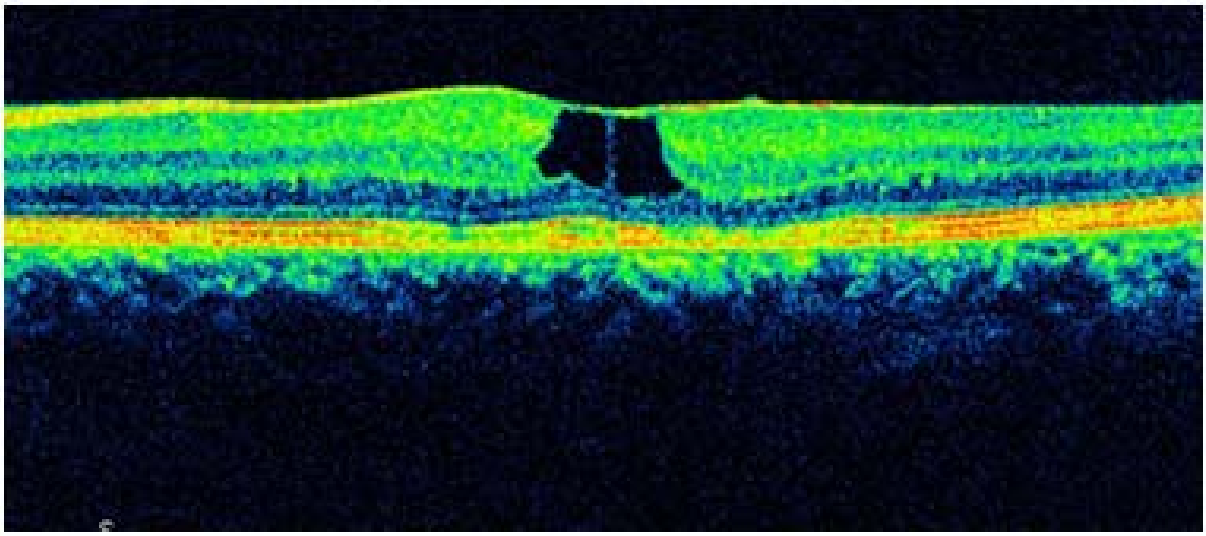
Ocular Coherence Tomography



Formation of retinal cysts that can encompass all retinal layers

Temporal foveal pit enlargement

Increased retinal thickening is seen in subretinal neovascularization



Formation of large inner retinal cysts. Only the internal limiting membrane is left in place over these areas, lending to the term "ILM Drape"

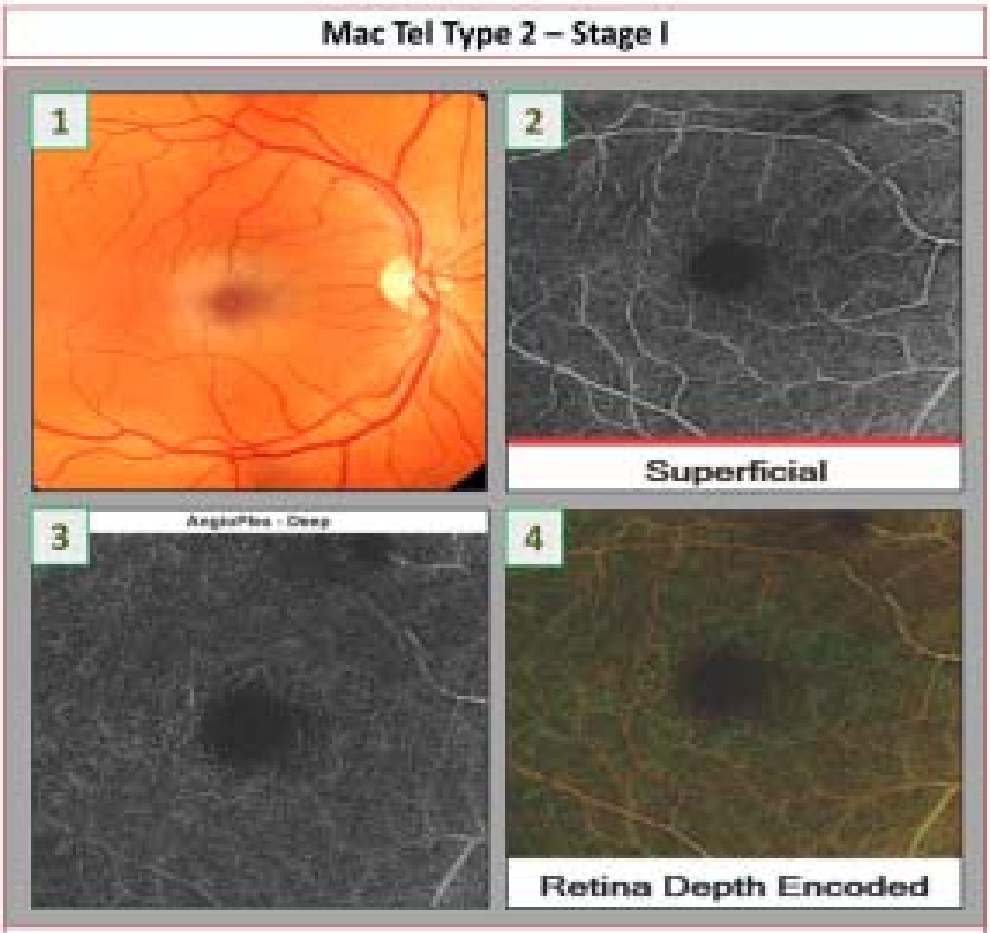
Hyper-reflective areas are due to RPE hyperplasia and migration

OCT-Angiography

OCT-A is a new advancement in the field. However the vascular abnormalities seen in OCTA are characteristic and helps in diagnosis.

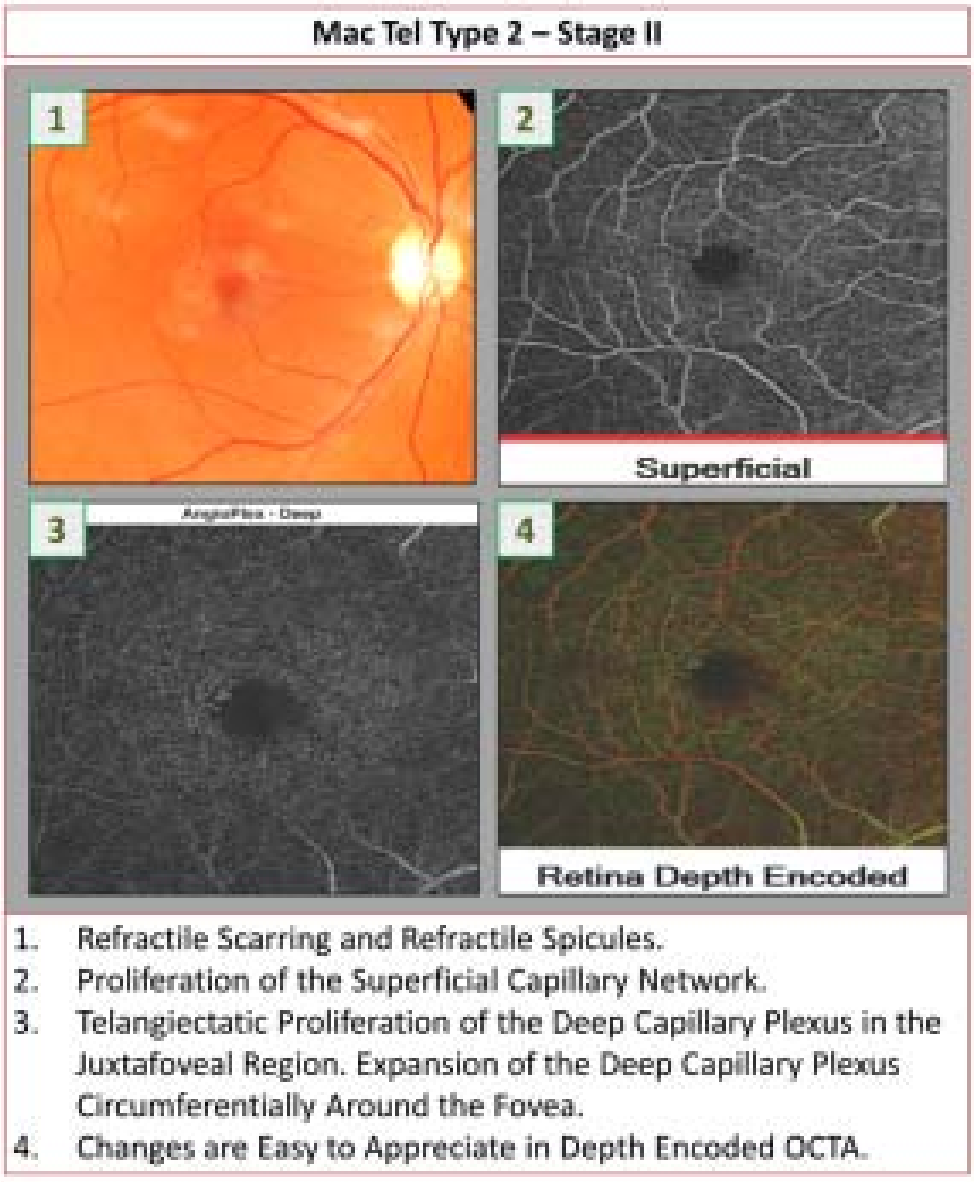
Case 1

66 years old male who is a diabetic presenting with progressive reduction of visual acuity (VA) over several years. His symptoms were worse in right (OD) eye than the left (OS) eye. On examination he had macular scaring with refractile spicules in his fundus and rest of the examination was unremarkable.



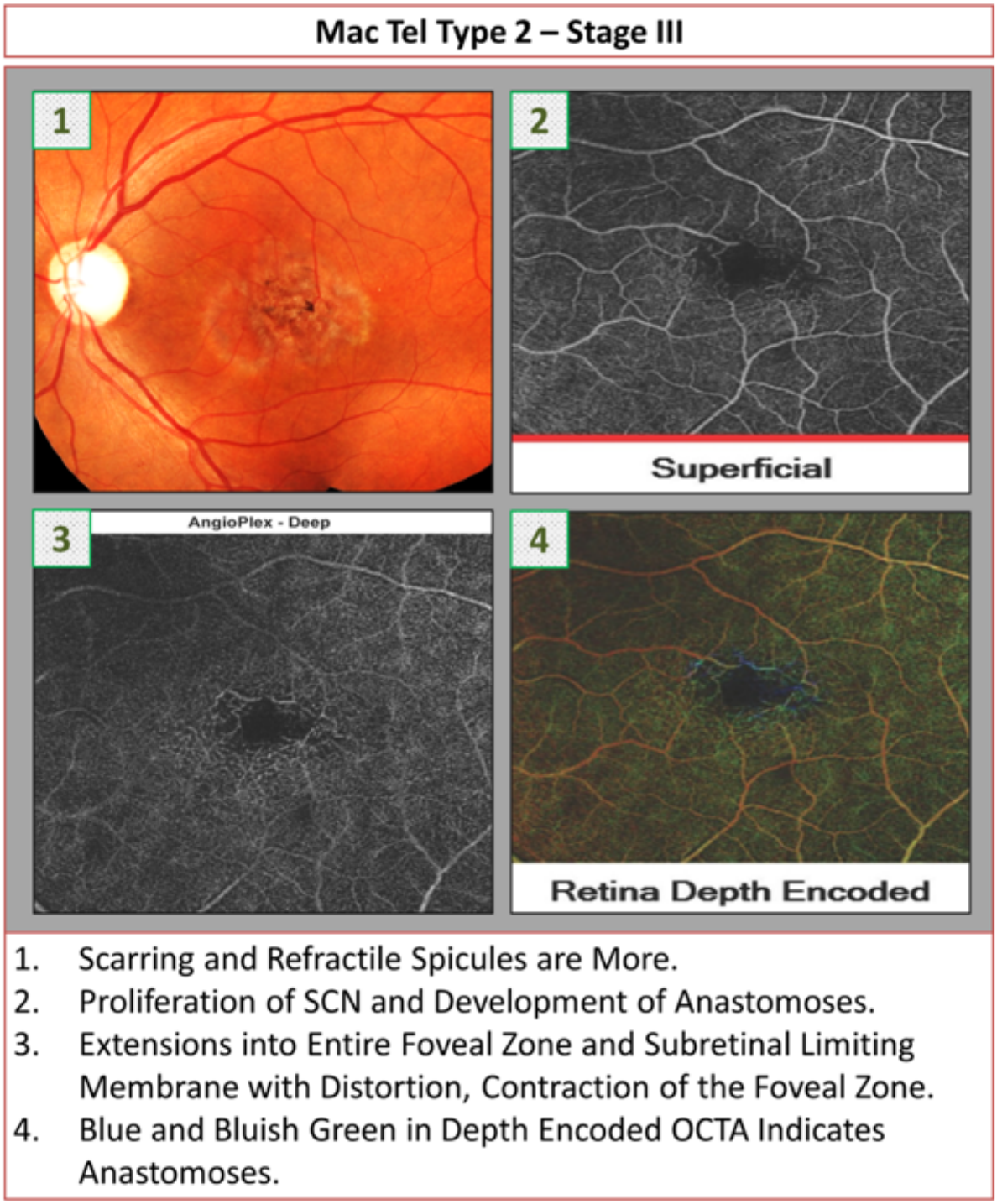
Case 2

A 58 years old female with no previous comorbidities presented with floaters of OD for 6 months. On examination she had minimal macular scaring with refractile spicules in OD and refractile spicules but no scaring in OS. Rest of her ophthalmic examination was normal.



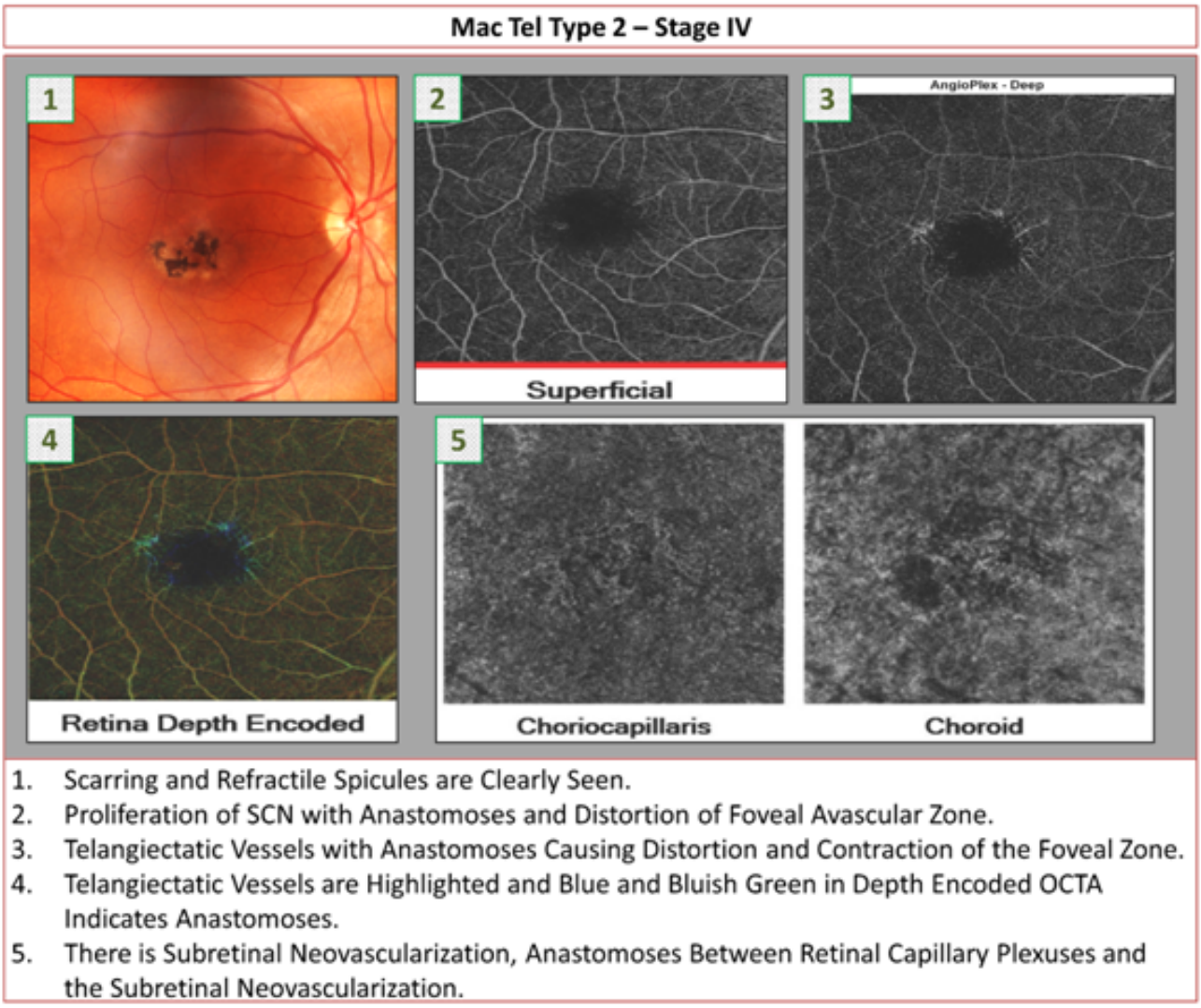
Case 3

A 55 years old male, with diabetes and hypertension presented with metamorphopsia for several months. He also had glaucoma and intraocular pressure was controlled with treatment. On examination he had high cup: disc ratio with early macular scarring with islands of refractile spicules on both (OU) eyes.



Case 4

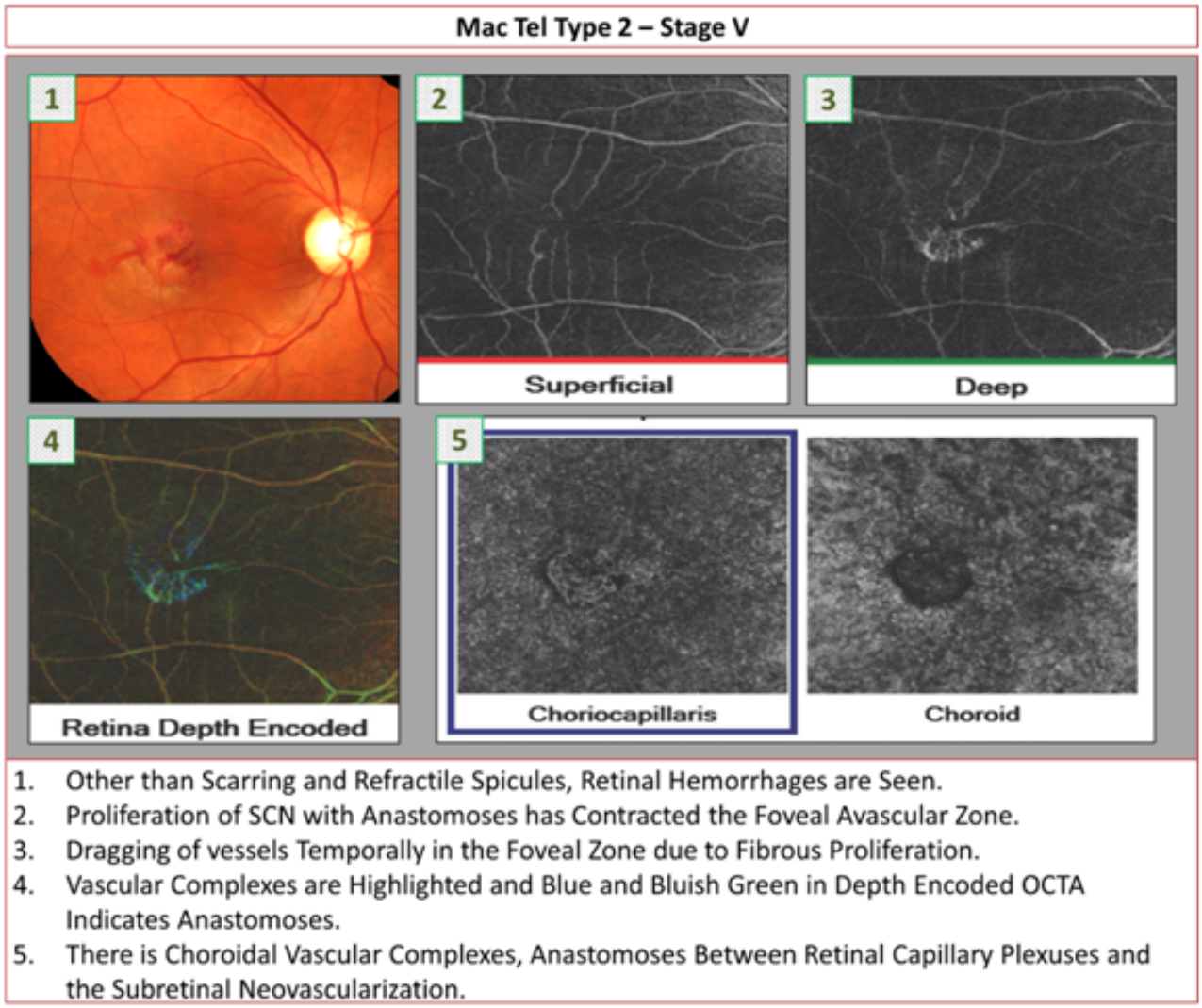
A 48 years old female who had hypertension presented with symptoms of presbyopia and floaters for 8 months. On examination she had macular scaring with atrophy and islands of refractile spicules on OU where rest of the examination was normal.



1. Scarring and Refractile Spicules are Clearly Seen.
2. Proliferation of SCN with Anastomoses and Distortion of Foveal Avascular Zone.
3. Telangiectatic Vessels with Anastomoses Causing Distortion and Contraction of the Foveal Zone.
4. Telangiectatic Vessels are Highlighted and Blue and Bluish Green in Depth Encoded OCTA Indicates Anastomoses.
5. There is Subretinal Neovascularization, Anastomoses Between Retinal Capillary Plexuses and the Subretinal Neovascularization.

Case 5

A 47 years old previously healthy female who had reduced on OU for several years presented with acute further reduction of vision on OD. Examination revealed macular scaring with atrophy and pre and subretinal haemorrhages and refractile spicules on OD. The OS had scaring, atrophy and islands of refractile spicules.



Discussion

Diagnosis of Mac Tel Type 2 depends on clinical picture which includes refractile scarring and refractil especules. Outer and inner retinal defects on OCT, OCT-Angiographic features in the deep retina are charac-teristic and useful in diagnosis. In Mac Tel Type 2, capillary telangiectasia is more difficult to detect bio-microscopically, but the angiographic and OCT findings are diagnostic with very limited treatment options. OCT-Angiography is non-invasive, fast and superior to fluorescein angiography in visualizing retinal and choroidal vasculature. It detects vascular abnormalities at an early stage, even before they cause clinically detectable exudation.

Conclusion

OCT-Angiography is non-invasive, fast and superior to fluorescein angiography. Early diagnosis of "Mac Tel" helps to avoid unnecessary investigations and treatments.

Dr. P. Sivasubramaniam Oration – 2016

"Vision for all: reaching the unreached"

Champa Banagala

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 16-24

As we all know this oration is dedicated to the memory of probably the greatest Ophthalmologist who lived in Sri Lanka during our time, Dr. Ponnaiah Sivasubramaniam. He was a founder member of the Ophthalmological Society of Ceylon in 1957 and also was the President of the Society in 1962.

In 1974, Dr. Sivasubramaniam was the President of the 5th Congress of the Asia Pacific Academy of Ophthalmology. Further, he was the President of the Sri Lanka Medical Association in 1976 and the Founder President of the College of Ophthalmologists of Sri Lanka in 1991.

He will be remembered as a great surgeon with abundance of fine human qualities who was always eager to serve the poor people living in remote corners of the country. Between 1978 and 1985 as the President of "Eye Care Sri Lanka" he visited 22 districts out of the 24 of the country with his competent trainee, our beloved teacher Dr.P.A.Wirasinhe who was the Secretary of the "Eye Care Sri Lanka". I was fortunate to join them and work with them in few of those camps.

Over the years, Dr. Sivasubramaniam has earned a well-deserved reputation as an excellent teacher and needless to say that we were happy and fortunate to be his students. He was a perfectionist who always encouraged us to go for the excellence. In one of his letters written to me in 1992 he emphasized that "the knowledge we have is a handful but what is to be learned is a worldful". This statement is a fine display of his wisdom aptly blended with humbleness.

Dr. Sivasubramaniam was a great team worker. Everybody learned from him and he was humble enough to learn from everybody irrespective of their position. Once he said "I have learned tricks from attendants in eye units, from nurses and from Colleagues of equal rank".

Appreciating and paying compliment for the people for their work done had been one of his finest qualities. I am sure those who had worked with him for years have this pleasant experience and memories, and will vouch for what I talk about today.

He always encouraged me to actively participate in the events of the College and expected me to one day provide the leadership to the College. In one of his letters written to me he has remarked "When your turn is up and if I am around the place, I will extend to you whatever measure of help I can give". As he expected I was installed as the President of the College in 2003. Ladies and Gentleman, sadly he was not there to share my joy at this memorable occasion, neither was he there to support me in my Annual Congress.

After this brief tribute to Dr. Sivasubramaniam for whose memory this oration has been organized I would now like to go to the technical aspects of my oration. As you know the topic that I have selected for my oration today is "Vision for All: Reaching the Unreached".

Introduction

The phrase "Vision for All" may sound as an attempt to bring back vision for all blind people. While acknowledging the need of pursuing this to the limit of our present knowledge of ophthalmology permits, I would like to point out that I am using the phrase to embrace a much larger scope. Prevention of blindness and improving the vision of those who suffer from low vision are two very important aspects that are included within this scope.

Knowledge of the physical world around us is obtained through our senses. Vision is the most precious and vital sensation we experience. Our life styles and in fact our whole culture has been built to suit those who have vision. Therefore, loss of sight is one of the greatest misfortunes that can befall on a human being. While each persons' blindness is his own individual predicament, blindness is more than a personal tragedy. It is in fact one of the commonest causes of social dependency with profound human and socio-economic loss. Low vision also has similar repercussions though at a some what milder scale. Both blindness and low vision cause many a hardship to those suffer from them.

Let's see what happens when someone has low vision.

Visual impairment lead to low quality of life on its own, and impact on daily activities. It can affect individuals physically and mentally. Let me give you few examples. With loss of visual field, the tasks most affected are the mobility and the ability to maintain autonomy. The Blue Mountain eye study has shown that visual impairment is significantly associated with falls and increase probability of hip fractures[1].

A cross sectional study has shown that the prevalence of depression rose with increased glaucoma severity and is more common in elderly patients with advanced glaucoma treated with various eye drops[2]. Macular degeneration which is the commonest cause of blindness in the western world results in loss of central vision which is needed for recognizing faces reading, watching TV etc. Also, it has been shown that in Age Related Macular Degeneration patients the incidence of depression is approximately twice the prevalence found among age-matched controls[3].

Common causes of blindness and low vision are well known. According to WHO figures published in 2010, 285 Million people are estimated to be visually impaired worldwide: 39 million are blind while 246 million have low vision4. Causes of blindness and Low vision have changed over years.

Blindness and low vision figures vary globally depending on the period of study.

Infective causes are on the decline, with glaucoma, diabetes and age related macular degeneration showing an upward trend[5].

Another important factor which affects these figures are the socio-economic development in a country. This has been clearly demonstrated in several studies where the prevalence of blindness varies with per capita income of the country[6] (Figure 1).

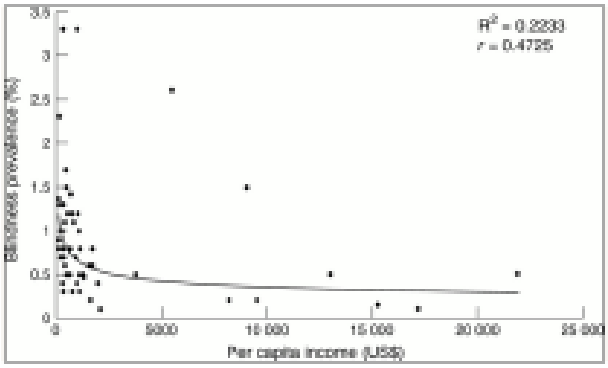


Figure 1. *Prevalence of blindness versus per capita income, per country.*

The good news is that WHO data estimates around 80% of visual impairment in the world could have been prevented or cured[4]. It is worthwhile to investigate why this preventable blindness continues and what prevents it from eradication. Letting preventable blindness and low vision to continue is in a way a not fair and it is responsibility of all concern groups to take every step at least to minimize it.

Disability and poverty

Global perspectives

Disability and poverty are two topics that are closely interwoven. Both can be the cause as well as the effect. Globally it is estimated that one in five of the world's poorest people have a disability[7], and 82% of the disabled people in developing countries lives below poverty line. Poverty can be thought of, as the absence of opportunities to lead a life of dignity and respect.

Vision impairment is a serious disability associated with tragic consequences. It is also both a cause as well as an outcome of poverty. Unfortunately, in many situations people with visual impairment are excluded from basic health and education services leading to economic deprivation. As I pointed out earlier global distribution of blindness indicates a higher prevalence existing in developing countries with lower per capita income.

Visually impaired children in low income countries are deprived of schooling. Lack of infrastructure, affordable health care, production of accessible and suitable school materials and qualified teachers prevent visually impaired children from attending school in many low-income countries. Inadequate nutrition, poor sanitation, lack of safe drinking water and limited access to health care are all central elements of poverty, contribute to avoidable blindness.

Currently in many low-income countries programmes and wide range of public health interventions are in place that enhance children's access to education and reduce hunger, malnutrition and blindness.

Local perspectives

After ascertaining the global situation related to preventable blindness and vision impairment and their intimate relationship with the poverty let us now focus ourselves on the situation in our own country, Sri Lanka.

Sri Lanka has a human development index(HDI) value of O.750 in 2013 which places it in the development category. It is ranked 73rd among 187 countries for

whom HDI values have been computed[8]. Also it is one of the fastest aging countries in the world[9]. This has led to a rapid transition in disease profile from a predominately communicable disease to non-communicable diseases[9]. Further, Sri Lanka national poverty line which was 8.9% in 2010 has come down to 6.9% in 2012/2013[10] (Figure 2).

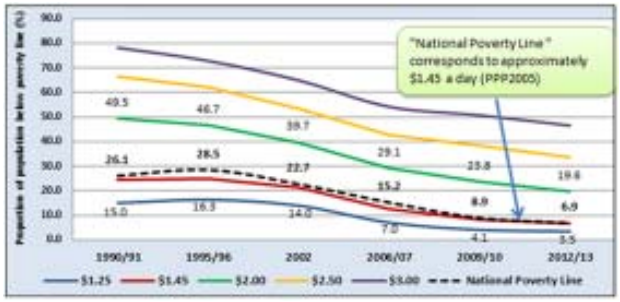


Figure 2. *Proportion of population below different Poverty Lines (Global PPP2005 and National) – 1990/91 to 2012/13.*

In spite of the colossal sum of money spent in Sri Lanka for the health, the tradition of probing into the success achieved through surveys and other acceptable means is not adequate. Eye health programmes are no different and seriously suffer from this deficiency. In this respect, recent attempts made to overcome this information scarcity in eye health by the Sri Lanka National Visual Impairment and Blindness Survey is truly commendable[11]. This survey also explored the association between blindness and deprivation and concluded that blindness is associated with poverty and lower access to services.

The Sri Lankan blindness survey showed that prevalence of blindness is 1.7% (95% CI: 1.3-1.99) in over 40-year population with an estimate of little over 127 thousand people being blind at 3/60 vision (Figure 3). You may be surprised to hear that prevalence of low vision is ten times more of that number; that is little over 1.27 million![11]

Vision Category	Prevalence	95% CI
Normal (near normal)	67.5%	66.3-68.7%
Mild visual impairment (<6/12-6/18)	13.6%	12.7-14.5%
Moderate visual impairment (<6/18-6/60)	15.4%	14.5-16.4%
Severe visual impairment (<6/60)	1.6%	1.2-1.9%
Blind (<3/60)	1.7%	1.3-1.99%
Vision not recorded	0.2%	0.12-0.37%

Figure 3. *Prevalence of blindness and visual impairment in Sri Lanka.*

Cataract was the commonest cause of blindness (66.7%) followed by uncorrected refractive errors (12.5%) (Figure 4).

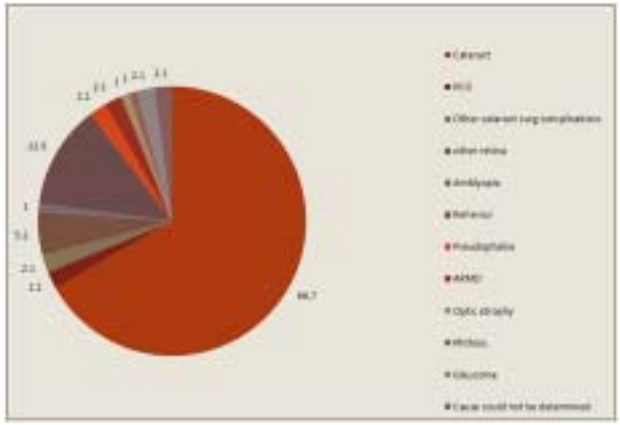


Figure 4. *Causes of blindness among adults aged 40 years and above in Sri Lanka.*

Sri Lanka's figures for prevalence of blindness is good when compared with other countries in the region, except for Bangladesh[12] and Nepal[13], which have shown slightly better figures. This correlates well with eye care service delivery in a country as well as level of socio economic development and education, both of which are high in Sri Lanka. Sri Lankan study showed a noticeable difference of blindness figures in different provinces and different sectors:[11] what was lacking was equity.

Blindness prevalence is highest in estate sector and when taken by provinces Uva, Eastern, Northern and North-Western Provinces have noticeable level of blindness. In Western and Southern provinces prevalence of blindness was low. (Figure 6).

Central Bank statistics also shows that Estate sector (Badulla and Ratnapura) and provinces Uva (Monaragala), Northern (Killinochchi), Eastern (Batticaloa and Mullaitivu)and North Western provinces (Mannar) show a high poverty head count index and high poor household percentage in the same period[14] (Figure 7). This clearly shows the association of blindness with low per capita income.

When Socio Economic status is considered, it is theLowest Quartile that has the highest prevalence of Blindness. Also, you may see that the prevalence of blindness is significantly high in the elderly.

What about the association of blindness with the education level? As you can see it is the people with no education or less than primary education who had the highest prevalence rates (Figure 8).

Causes	Mild VI		Moderate VI		Severe VI		Blind	
	n-788		n-892		n-90		n-96	
	N	%	N	%	N	%	N	%
Refractive errors	638	81.0	571	64.0	42	46.7	12	1 2.5
Lens related								
Cataract	62	7.9	205	22.9	33	36.7	64	6 6.7
Pseudophakia	60	7.6	71	8.0	2	2.2	2	2.1
PCO	8	1.0	14	1.6	5	5.6	2	2.1
Surgical complications	1	0.1	2	0.2	1	1.1	2	2.1
Uncorrected aphakia	8	1.0	7	0.8	2	2.2	0	0.0
Glaucoma	0	0.0	1	0.1	0	0.0	2	2.1
Retinal disorders								
Diabetic retinopathy	3	0.4	3	0.3	0	0.0	0	0.0
Other vasculopathy	0	0.0	1	0.1	0	0.0	0	0.0
ARMD	2	0.3	2	0.2	2	2.2	2	2.1
Other retinal disorders	1	0.1	6	0.7	0	0.0	5	5.2
Other disorders								
Corneal opacity	0	0.0	2	0.2	0	0.0	0	0.0
Optic atrophy	0	0.0	0	0.0	0	0.0	1	1.0
Amblyopia	5	0.6	7	0.9	3	3.3	1	1.0
Phthisis	0	0.0	0	0.0	0	0.0	1	1.0
Cause could not be determined							2	2.1
		100		100		100		100

Figure 5. *Causes of blindness and visual impairment in Sri Lanka*

	Socio-demographic variables	Examined	Blind	Prevalence	Chi²
		N	N	%	
Age group	40–49 years	1708	3	0.1	
	50–59 years	1020	8	0.42	
	60–69 years	1424	19	1.33	
	≥70 years	700	66	8.4	358.72; p<0.001
Gender	Male	2358	39	1.5	
Province	Uva	848	10	2.87	
	Eastern	415	11	2.65	
	North West	886	15	2.56	
	North	333	12	2.17	
	Central	690	13	1.87	
	North Central	346	6	1.73	
	Sabaragamuwa	510	7	1.37	
	Western	1648	20	1.21	
	South	678	3	0.39	19.61; p<0.01
Socio-economic status	Lower middle quartile	1663	20	1.2	
	Upper middle quartile	1288	17	1.32	
	Highest quartile	1329	11	0.98	22.68; p<0.001
Residence	Rural	6102	88	1.72	
	Urban	677	8	1.18	1.07; p=0.29
Religion	Hindu	839	24	2.86	
	Buddhist	4359	64	1.47	
	Christian	388	7	1.80	
	Islam	192	1	0.52	9.90; p=0.02
Ethnic group	Tamil	1058	27	2.58	
	Sinhala	4848	69	1.5	
	Moor	180	1	0.56	7.36; p=0.02
Literacy	Non literate/1st Primary	827	26	3.66	
	Schooling to O level	1332	38	2.85	
	O level or above	4120	80	0.73	128.8; p<0.001

Figure 6. *Association of blindness with socio demographic characteristics.*

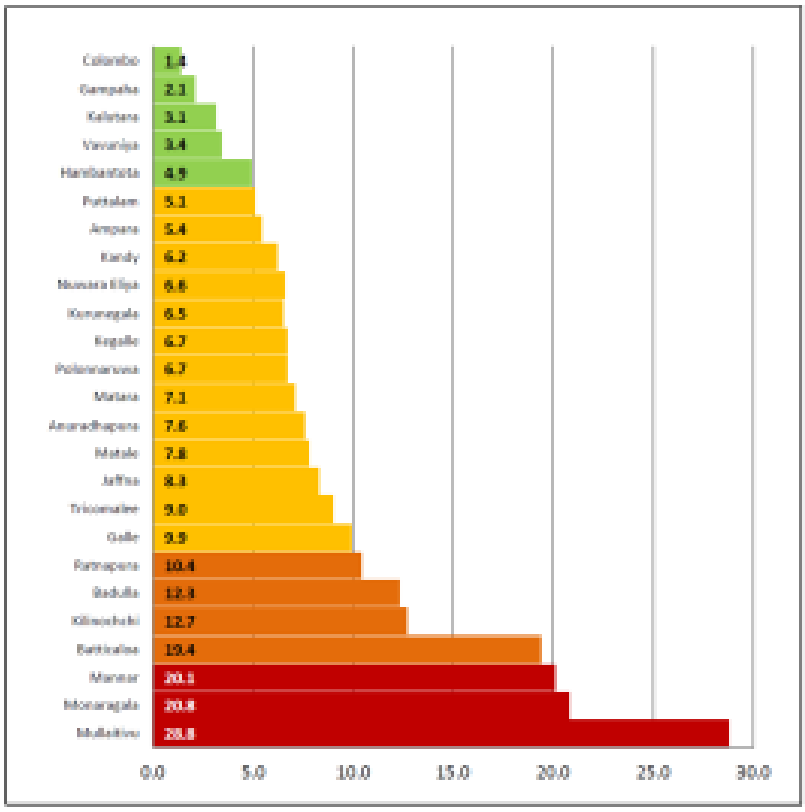


Figure 7. *Incidence of poverty (%) by Districts in Sri Lanka – 2012/13.*

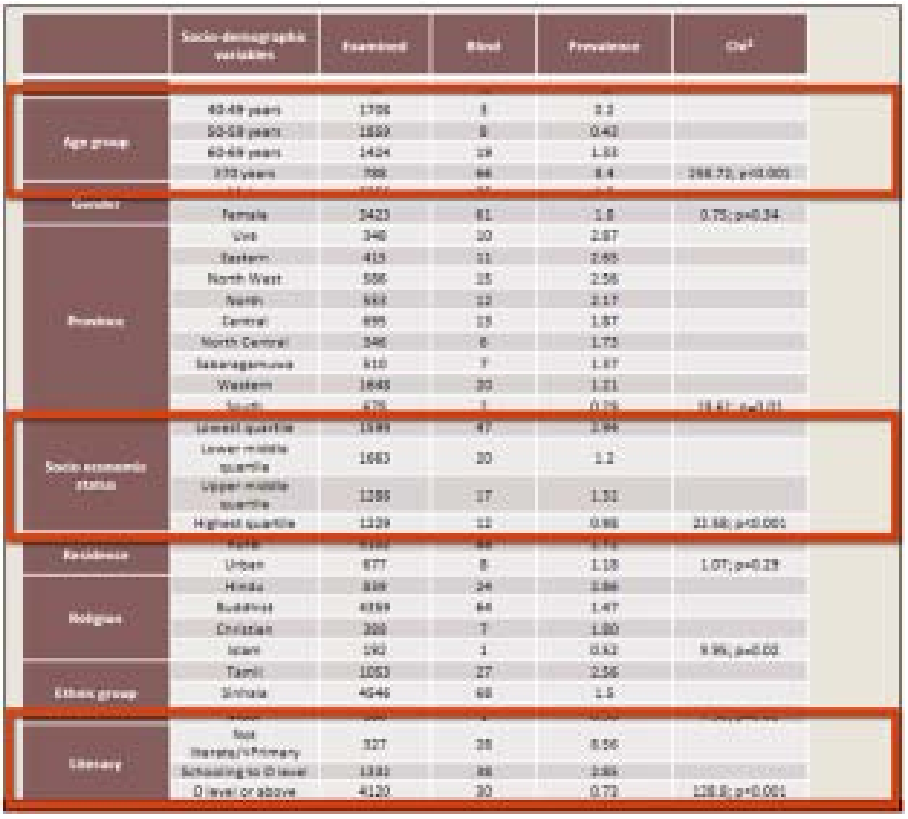


Figure 8. *Association of blindness and socio-demographic characteristics.*

The blindness survey also showed that the cataract surgery coverage at 3/60 level is 85% and at 6/18 level it is 54.4%.

In addition, it showed that cataract surgery coverage was significantly lower in old ages, among those with poor literacy, lower economic status and those residing in North West, Uva and Central provinces in the country. Central province includes most of the estate sector.

There is a segment in the population who are either unable to utilize the services or not aware of the services. Why? Why aren't we reaching the unreached?

The National Blindness Survey looked into this aspect as well.

What were the barriers to uptake of services?

Two thirds of the population who were blind and low vision did not seek treatment because it was too expensive for them, and also had other family priorities (Figure 9).

Sri Lanka government is doing the maximum to reduce the prevalence of blindness in the country.

Will the overall development of a country improve the blindness figures?

Yes, it has been shown that when the per capita income in a country improves the incidence of blindness figures decrease[6]. Because poverty has a strong association with blindness.

Preventable blindness and vision impairments: reaching the unreached

As explained earlier preventable blindness and vision impairments are more prevalent among communities stricken by poverty. At the initial stages of the disease some are unaware of what they are going to face in the future due to the lack of education. Some are even not aware of the possibility of curing some of the eye disease that may eventually lead to blindness. Others may have been denied of access to medical treatment due to poverty.

Even in countries such as Sri Lanka where free health services are available extremely poor cannot afford to reach the centers where services are provided. It is not a secret that most of the facilities required for the treatment of relevant diseases are mainly available in urban areas. Those who eke out a day to day life simply postpone getting treatment as their priority is looking after their families and may consider spending hours in crowded clinics is wastage of time. Actually, in most of the cases combination of several factors mentioned above lead to chronic stages of the disease. Once they become blind they will drag into the level of poorest of the poor further denying their opportunities of getting back their vision and this vicious circle continues. Some may even accept the plight they are in as their fate and not make any attempt to come out of it. These are the unreached groups when talk about vision for all. How to reach this unreached group is an enormous challenge than we anticipate.

Barrier	Cataract (n -97)		Refractive error	
	N	%	N	%
Too expensive	59	60.8	35	64.8
Other family priorities	32	33.0	12	22.2
No one to accompany	16	16.5	6	11.1
Can manage – no need	11	11.3	15	27.8
No time	8	8.2	8	14.8
Fear/apprehension	5	5.1	1	1.8
Did not know where to go	4	4.1	1	1.8
Did not know treatment possible	3	3.1	4	7.4
Others	8	8.2	4	7.4

Figure 9. *Reasons for not seeking treatment for poor vision due to Cataract.*

There are two paths of reaching this unreached group providing them with solace. The first is the general path while the other is a specific path. Let us first concentrate on the general path which attempts to eradicate the root cause of this tragedy, i.e. the poverty; the extreme poverty.

General strategy

Poverty is a global issue and should be handled by global level institutions such as the United Nations. It is heartening to note that this has been in the spotlight of the United Nations since commencement of the present millennium and what is strived to be achieved is collectively known as Millennium Development Goals, MDGs. The MDGs, were eight international development goals expected to be achieved by 2015[15]. The eight goals including eradication of extreme poverty, achieving universal primary education, combating HIV/AIDS and other diseases had been identified and necessary funds to achieve those had been set aside through the World Bank, International Monitory Fund and the African Development Bank.

It is worthwhile to see how much of these efforts are successful in providing a glimmer of hope seeing light at the end of the tunnel. In fact, there are positive evidence of success we can rejoice. Overall visual impairment worldwide has decreased since the dawn of the millennium despite an aging global population. This decrease is principally the result of a reduction in visual impairment from infectious diseases through:

Overall socioeconomic development;
Concreted public health action
Increase availability of eye care services;
Awareness of the general population about solutions to the problems related to visual impairment (surgery, refraction devices etc.)[16].

Recent literature appeared in reputed Ophthalmological journals also further illustrate how improvement of socio-economic factors has paved the way for eventual eradication of preventable and avoidable causes of blindness.

Sri Lanka is one of the countries that successfully achieved most of millennium development goals at the prescribed target time of 2015. It is no secret that free education and free health services Sri Lankans has been enjoying a time period that goes well over half a century would has contributed towards this in a big way. Further, there are sufficient evidence provided from Central Bank reports with regard to eradication of poverty to a noticeable level which would have contributed towards improving the health of the country including its influence on eradicating preventable blindness and low vision. Unfortunately, no much data with regard to these aspects available to do a meaningful study and draw conclusions. However, there is nothing wrong in assuming that global trends of improving health is also prevailing in Sri Lanka.

Specific strategy

Certainly, we have sufficient reasons to be complacent about the success of the general path of reaching the unreached in providing vision for all though the impetus given by the Millennium Development Goals. In countries such as Sri Lanka positive attempts made by the respective governments are also needed to be viewed with gratitude. Now let us look at the specific path we can take in reaching the unreached in relation to providing vision. Specific paths are those taken by individual countries. Therefore, I will confine myself only to Sri Lanka in discussing this aspect. As we all know the VISION 2020 programme is a typical example that is been conducted in this regard.

As it has been already established it is the poorest of the poor who missed the opportunity of getting proper attention to their ophthalmic problems. Over a long time, it has been considered that it is their responsibility to make best use of available facilities to address problems related to their health. This stubborn as well as rather selfish attitude has led to the creation of unreached group that we are talking about. As all these are stemming from the poverty which is a socio-economic condition for which whole society has contributed, civilized people throughout the world consider it is the responsibility of everybody to help these deprived groups to come out of their misery. While each sector of the society should address this in the manner most suitable to them and their capabilities, a large slice of the responsibility goes to health workers. In view of their expert knowledge ophthalmologists have very special responsibility to address this problem. I am happy to say ophthalmologists of the country have come forward to take up this responsibility quite willingly over the years. Out reached screening in remote areas in the country followed by cataract surgeries that we all are familiar with, is fine display of how well they have taken up responsibility.

Screening for refractive errors and cataract surgeries in Sri Lanka has a long history. I have indicated at the beginning of my oration how Dr. Sivasubramanium, for whose memory this oration is being held screened patients and operated the poorest of the poor in remote areas in 22 districts out 24 in the country. This tradition since then has been continued by generations of ophthalmologists with ever increasing vigor and enthusiasm. Even though I do not have sufficient evidence based on statistics, as a person who actively

engaged in this exercise can confidently say that these programmes have contributed towards the alleviation of the sorry plight of large number of people having been denied of proper treatment.

It appears that the information related to preventable blindness and vision impairment have not reached the poverty-stricken communities. It is surprising that this happens in the present era dominated by communication devices with all sorts of facilities. In Sri Lanka number of cellular phones available exceeds its population. Most of the people have access to television or at least to a radio. I am sure ophthalmologists working in collaboration with communication experts can find a way of conveying this message to the relevant group. Some of these messages can be direct and some can be indirect such as through work or art. Whatever the way you select it necessary to have an enormous amount of creativity in designing and presenting such information.

It is mandatory today that all children below the age of sixteen should attend school. We are really proud that such children in this age cohort have been assigned a school free of charge in Sri Lanka. These children can be educated about preventable blindness, vision impairment, how they can be avoided and steps to be taken once it has happened. This could well be a part of health science curriculum. Health workers collaborated with education department may find a creative way of transmitting the knowledge the young have acquired to their elders at home.

The way forward

We have identified both general paths as well as specific paths to reach the unreached in relation in providing vision for all. Most important aspect of the general path is eradication of poverty. This has been addressed through Millennium Development Goals throughout the world. Target to Millennium Goals ended in 2015.

In 2016, United Nations introduced Sustainable Development Goals. Sustainable Development Goals popularly known as SDGs is a set of seventeen aspirational goals to be achieved by 2030[17].

It heartening to note that the very first of the seventeen sustainable goals is ensuring end of poverty in all forms everywhere. Third and fourth goals are ensuring good health and wellbeing for all at all ages and ensuring quality inclusive and equitable education and promotion of lifelong learning. As you would have noted all these will fulfill the requirements of the long term path of providing vision for all.

With regard to the specific strategy let me just make the simple comment that in addition to the few short-term mechanisms to reach the unreached that I have mentioned earlier I am sure there can be much more if one think of creatively and act with commitment remembering their social responsibility. Key terms here are creativity and social responsibility.

With those remarks let me conclude 2016 Dr. Sivasubramanium Oration which I made as a tribute to a person whom I admire very much as a teacher, a mentor and later a senior colleague. I wish to thank the President and the Council of College of Ophthalmologists for giving this opportunity which valued very much and finally I thank all of you for your patient listening.

Acknowledgements

My sincere thanks to Prof. Dhammika Tantrigoda and Prof. Ramani Tantrigoda for helping me in preparing this presentation. Also I would like to thank Dr. Thushara Banagala and Dr. Sammera Fernando for helping me with the slides at the presentation. The support extended to me by my husband is greatly appreciated.

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Videotape versus live demonstration in enhancing the technique and confidence of direct ophthalmoscopy in undergraduate medical education: A randomized controlled trial in a South Asian medical school

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The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 25-30

Abstract

Introduction and Objectives: *Ophthalmoscopy is a core clinical skill. Our objective was to evaluate the effectiveness of a videotape, a live demonstration and a combination of above, in acquiring competence in Direct Ophthalmoscopy (DO) among medical undergraduates.*

Materials and Methods: *A randomized controlled trial was conducted among pre clinical medical students of University of Colombo. Students were randomly allocated to three groups. Group-V and Group-L were trained on DO for 20 minutes using a videotape and by a live demonstration respectively. A third group (Group-VL) was trained with both methods for a total of 20 minutes. Videotapes were obtained while students performed DO on a simulated patient. Three blinded examiners assessed the recordings individually using the modified Queens University Ophthalmoscopy OSCE checklist. Learning styles were assessed using the VARK questionnaire.*

Results: *A total of 106 students [37.7% (n=40) males] were assessed. The mean score of DO was (10.0±2.5)/14. Majority were multimodal learners (61.3%, n=65). A two-way ANOVA showed a statistically significant effect of teaching method on performance score of DO [F(2,86)=7.024, p=.001, partial* η^2*=.140). Post-hoc comparisons indicated that mean scores for each group were significantly different: Group-V (M=8.27, SD=2.07); Group-L (M=10.15,SD=2.32) and Group-VL (M=11.71, SD=1.47), p<.001. The interaction effect for learning styles, F(4,86)=0.398, p=.810, did not reach a statistically significant level.*

Conclusions: *The live demonstration showed a better result than the video tape demonstration (p<.05). The combination of video tape and live demonstration was significantly better than the other two methods (p<.05). Their performance was not affected by learning styles. We recommend a combined approach as the preferred method of teaching DO to medical undergraduates irrespective of their learning styles.*

Key words: direct ophthalmoscopy, medical education, live demonstration, videotape

Introduction and objectives

Ophthalmic evaluation is a core clinical skill that all the medical personnel should be competent in. Prevalence of eye related conditions in primary care practice is very high with 5 to 19% of the patients presenting with an eye related complaint[1]. General practitioners are the first line contacts of ophthalmic emergencies. Thus they should be competent in triaging and referring such emergencies to specialist care efficiently[2]. Similarly, with an aging population, prevalence of conditions which lead to visual impairment such as cataract, glaucoma, diabetic retinopathy and age related macular degeneration are rising[3]. Impaired vision not only reduces the quality of life, but is a constant threat to life[4]. A prospective cohort study concluded that the poor vision is an independent risk factor for falls and hip fractures among geriatric population[5]. Early detection of these conditions with a simple ophthalmic evaluation and timely referral in a primary healthcare perspective has shown to improve patient outcomes[6]. Therefore it is quite reasonable to state that all the undergraduate students need an adequate training in Ophthalmology[7].

Unfortunately, over the last few decades, the time allocated for ophthalmology teaching sessions in undergraduate curricula has reduced drastically[3]. A number of universities have completely cut-off ophthalmology from the undergraduate syllabi[8]. This has been mainly attributed to the time pressure in teaching skills in a vastly evolving subject of Medicine[9,10]. Numerous studies have been carried out worldwide to evaluate the outcome of this potentially hazardous trend and the universal conclusion is that the reduced ophthalmological exposure among undergraduates leads to low self confidence and poor knowledge in common ophthalmological conditions among non-ophthalmological clinicians[9, 11]. Similarly, it has been shown that the patient outcomes have worsened with poor undergraduate training in ophthalmology[3,9,12]. Therefore it is essential to deliver a focused training in Ophthalmology to medical students in a limited time frame.

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Over the last few years, experts in ophthalmology and medical education have initiated developing an integrated curriculum in Ophthalmology including the core clinical concepts and minimum knowledge based approaches to overcome the time constraints. Albeit the core knowledge expected from a graduate differs in few aspects in these approaches, ophthalmoscopic examination is highly recommended virtually by all, including the standards adopted by the Associations of University Professors in Ophthalmology and endorsed by the American Academy of Ophthalmology and International Council of Ophthalmology (13-15).

A wide array of research has focused on various techniques to teach Ophthalmoscopy to undergraduates. Teaching Ophthalmoscopy to Medical Students (TOTeMS) I & II trials have focused on fundal photography and simulator based training to enhance these skills[16]. Simulators have been used widely in research on ophthalmology teaching[17-20]. Despite recent advances in medical education field in Ophthalmoscopy, there is widespread evidence to suggest that the medical students and junior doctors are not confident and competent in this skill[11,21-23]. Some qualitative studies have shown that 'not enough formal instructions' is a major cause for the lack of Ophthalmoscopy skills[21,22]. Conversely, medical students have performed well after having given formal instructions[24]. But after an extensive literature survey using web based search engines like Google Scholar, Pubmed, MEDLINE and a manual search at Postgraduate Institute of Medicine, Sri Lanka, we could not find research which addressed how the different approaches of delivering formal instructions affect the individual's performance at Ophthalmoscopy. Finding out simpler methods instead of high fidelity simulation methods to enhance the undergraduate training of Ophthalmoscopy would be highly cost effective for the students in developing countries like Sri Lanka.

To our knowledge, this is the first randomized controlled prospective study investigating the effect of two different simple teaching approaches in undergraduate medical education: a videotape versus a live demonstration. We intended to evaluate whether a videotape, a live demonstration or a combination of above two is more effective in acquiring competence and confidence in direct Ophthalmoscopy (DO).

Materials and methods

This randomized controlled trial was conducted in the Faculty of Medicine, University of Colombo, Sri Lanka in May 2016. The study confirmed to the provisions of Declaration of Helsinki. The ethical approval was obtained from the Ethics Review Committee, Faculty of Medicine, University of Colombo. The study was approved by all the participating boards. The study was conducted on the second year pre-clinical medical students. All the second year medical students were invited for the study. None of them had received a formal teaching on DO previously.

The study instrument consisted of a self administered questionnaire. This consisted of two parts. Part A collected data on socio-demographic factors and educational background of the students. Age, gender, nationality, district of education, results of the end of first year medical school examination results and handedness (right handed or left handed) were assessed in part A. Part B was used to assess the learning styles of the individual student which was a potential confounder of the study. Visual Auditory Read/write and Kinesthetic (VARK) questionnaire was used for this purpose after obtaining the permission from the authors. VARK is a validated questionnaire which assesses the predominant learning preferences based on four sensory modalities: Visual, auditory, read/write and kinesthetic. Visual learners prefer information in maps, diagrams, charts or graphs etc. Aural or auditory learners prefer information which is heard or spoken. Read/write learners prefer information written as words. Kinesthetic learners prefer the use of experience and practice. [reference:web page]. There are also multimodal learners who have a mixture of preferences with no predominant learning style.

The study population was randomly allocated into three groups using simple random sampling method with computer generated random numbers. The three groups were names Group V, Group L and Group VL. Group-V was trained on DO for 20 minutes using a videotape. The video is freely available on and reproduced with the permission from the authors. The duration of the video clip was 10 minutes. Therefore it was looped twice during the given 20 minutes. The audio track was narrated by a doctor in English and subtitles were displayed to facilitate the understanding among local students. Group-L was trained on DO for 20 minutes using a live demonstration. Three medical doctors conducted the live demonstration sessions. They were trained under a consultant Ophthalmologist and pretested on three different occasions to ensure homogeneity of the training methods prior to the study. The content of the training session was similar to the video demonstration. A third group (Group-VL) was trained with both methods for a total of 20 minutes. An abridged version of live demonstration was used without reducing the essential content. The video clip was displayed only once for this group. In none of the instances students were given the opportunity to practice DO on themselves before the assessment. Students of each group were given a short duration to make necessary clarifications after training.

Students were asked to perform DO on simulated patients. The simulated patients were briefed by an investigator before the study. Each student had to perform the examination in an isolated examination room with adequate lighting. Videotapes were obtained from two different angles using high definition cameras during the examination. Audiotapes were also obtained to assess the commands given by the students to the patients. There was no time restriction for the examination. The video and audio tapes were coded and digitally processed afterwards. Three blinded examiners assessed the recordings individually using the modified Queens University Ophthalmoscopy OSCE checklist (performance score). This was a validated checklist and the scores derived from the checklist directly correlated the ability of a candidate to correctly identify retinal pathology (reference). The original checklist included 13 weighted items. The total marks allocated for the checklist was 24. But focusing on the retina, optic disc and following the vessels from the disc could not be assessed in our setting with the given facilities. Similarly since the study population was preclinical, they were not familiar with introducing self and gaining consent. The videotape also did not emphasize consent taking procedure. Thus four questions were withdrawn from the original Queens University Ophthalmoscopy OSCE checklist. Total mark (1 mark) allocated for focusing on the macula was given if the student asked the patient to look at the light source. The total marks allocated for the modified Queens University Ophthalmoscopy OSCE checklist was 14. The modified version of the Queens University Ophthalmoscopy OSCE checklist was validated after pretesting by a consultant ophthalmologist, five doctors, five final year medical students and five third year medical students. Three blinded examiners assessed the video clips in order to validate the checklist. The internal consistency of the checklist (as measured by Cronbach's alpha) was .87.

Same three blinded examiners assessed the videotapes of individual student and scored on the modified Queens University Ophthalmoscopy OSCE checklist. If there was a discrepancy of more than three marks between two examiners, the video clips were reassessed. The average mark of the three examiners was calculated.

Statistical analysis

Standard descriptive statistics were used to analyze and describe socio-demographic data. A two-way ANOVA was used to assess if there was a statistically significant effect of teaching method on performance score of DO after controlling for the interaction effect for learning styles. All analyses were conducted on Statistical Package for Social Sciences (SPSS) version 22 with a priori alpha of .05

Results

A total of 106 students were assessed. Mean age was 22.2 ± 0.9 years. Of them, 37.7% (n=40) were males and 62.3% (n=66) were females. Majority (94.3%, n=100) were Sri Lankans while six students (5.7%) were Bhutanese. None of them used English as their first language.

Five students had not filled the VARK questionnaire properly and one student had not returned the questionnaire. Therefore the learning styles were analyzed only among 100 students. Majority were multimodal learners (61.3%, n=65) followed by aural (14.2%, n=15), kinesthetic (10.4%, n=11), read/write (4.7%, n=5) and visual (3.8%, n=4). Sub group analysis of learning styles based on the affinity of the particular style (e.g. mild aural, moderate aural and severe aural) was not performed due to small number of the population.

The compositions of the three study groups (group-V, group-L and group-VL) are shown in Table 1. The distribution of different learning styles among three study groups is further elaborated in Figure 1. The mean score of DO was (10.0 ± 2.5)/14. Inter observer correlations of the performance scores were calculated using Kendall's tau correlation coefficients. There were strong positive correlations among all three examiners ($p<.01$). The results of these correlations are summarized in Table 2. The mean scores were distributed among the three groups as follows: The group which was trained only by the video (Group-V) scored the lowest marks (M=8.27, SD=2.07). The group which underwent the training based on the live demonstration (Group-L) scored better than Group-V (M=10.15, SD=2.32). The highest score was seen among the group which underwent both video and live demonstration (Group-VL) (M=11.71, SD=1.47). The results of the performance scores of DO are summarized in Figure 2. A two-way between groups analysis of variance (ANOVA) was conducted to assess the effect of teaching method on performance score of DO. Preliminary studies were conducted to ensure the assumptions of normality (Shapiro-Wilk test) and homoscadasticity. There was a statistically significant main effect of teaching method on performance score of DO [$F(2,86) =7.024$, $p=.001$]. According to Cohen (1998) criterion, there was a large effect in our study (partial $\eta^2=.140$). Post-hoc comparisons using Turkey HSD indicated that mean scores for each group were significantly different: Group-V (M=8.27, SD=2.07); Group-L (M=10.15, SD =2.32) and Group-VL (M=11.71, SD=1.47), $p<.001$. The interaction effect for learning styles, $F(4,86)=0.398$, $p=.810$, did not reach a statistically significant level.

Table 1. Composition of three study groups (Group V – Video only, Group L – Live demonstration only, Group VL – Video and live demonstration). Please note that the learning styles of 6 students are missing

		Group V	*Group L*	*Group VL*
Sample size		39	29	38
Mean age (SD) in years		22.1 ± 0.8	22.3 ± 0.7	22.0 ± 1.0
Gender	Male	12	16	12
	Female	27	13	26
Nationality	Sri Lankan	37	28	35
	Bhutanese	2	1	3
Learning Style	Visual	1	1	2
	Aural	3	5	7
	Read/write	4	0	1
	Kinesthetic	4	3	4
	Multimodal	26	19	20

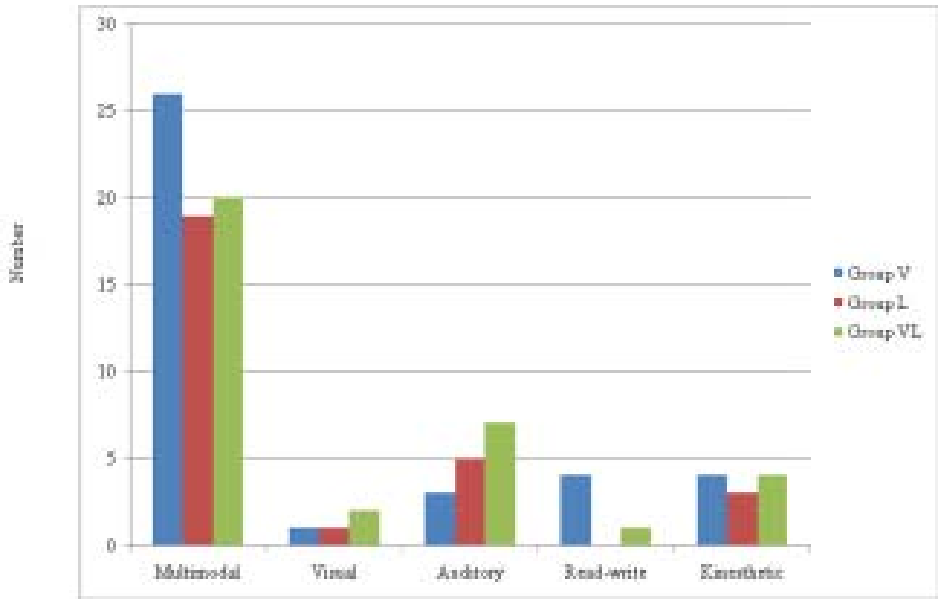

Figure 1. *Distribution of different learning styles among three study groups.*
(Group V– Video only, Group L – Live demonstration only, Group VL –Video and live demonstration).

Table 2. Kendall's tau correlations between the performance scores of DO by each examiner

Scale	*Examiner 1*	*Examiner 2*	*Examiner 3*
Examiner 1	-	.775**	.837**
Examiner 2	-	-	.778**
Examiner 3	-	-	-

**p<.01 (2-tailed)

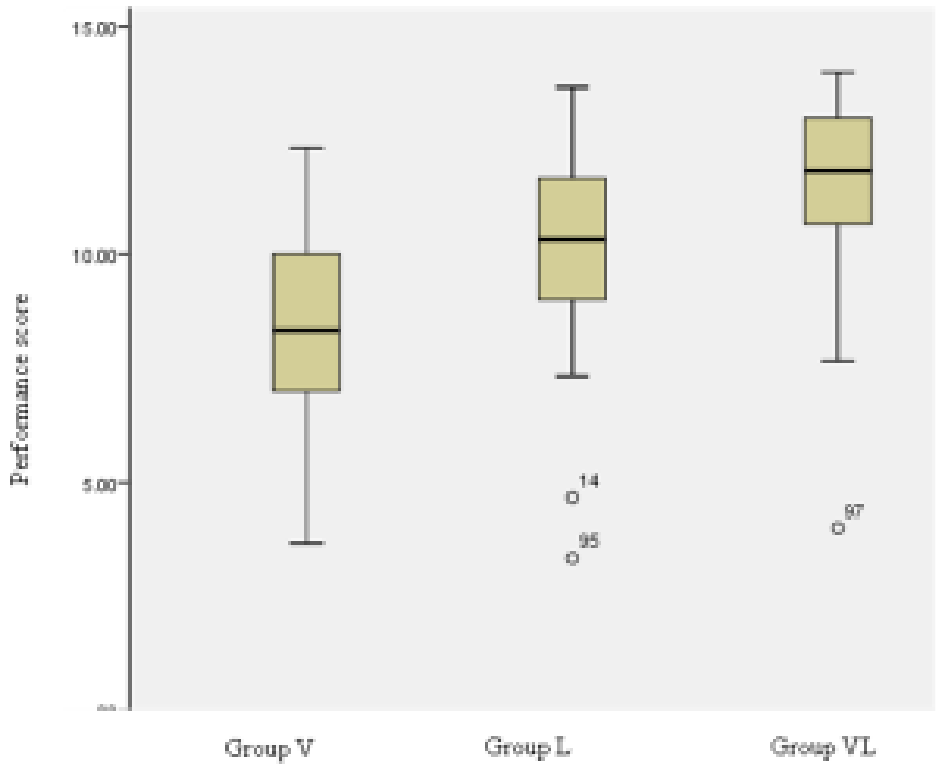

Figure 2. *Boxplot diagram of performance scores of Direct Ophthalmoscopy among three different groups. (Group V – Video only, Group L – Live demonstration only, Group VL – Video and live demonstration). The highest possible score is 14.*

Annexures

Annexure 1: Queens University Ophthalmoscopy Objective Structured Clinical Examination checklist (the original version). The stems which were not included in the modified version are shown in italic form.

Direct ophthalmoscopy technique checklist (point value in brackets)	**Done correctly (✓)**
Introduces self, gains consent (1)	…….
Uses right eye/hand to examine patient's right eye (and vice versa) (3)	…….
Turns ophthalmoscope on (1)	…….
Checks beam size and brightness (1)	…….
Begins ~40 cm from patient at 15° lateral to the patient's line of vision (1)	…….
Advises patient to fixate on a spot on the wall (1)	…….
Keeps both eyes open while examining the patient (1)	…….
Finds the red reflex and follows it in (2)	…….
Appropriate proximity to the patient (3)	…….
Focuses the ophthalmoscope (3)	…….
Focuses on optic disc (3)	…….
Follows the vessels from disc (2)	…….
Focuses on macula (1)	…….

Discussion

In this randomized controlled trial, we compared two methods, i.e. a videotape, a live demonstration and a combination of both to teach Direct Ophthalmoscopy to medical undergraduates. We found that the group which underwent live demonstration showed a better outcome than the group that underwent video tape demonstration ($p<.05$). The performance scores of the group that underwent the combination of video tape and live demonstration was significantly better than the other two groups ($p<.05$). Students' performance was not affected by their preferred learning styles irrespective of the training method they underwent.

This randomized controlled trial was conducted in a single centre. Multicentric studies among different ethnicities may be necessary for global inferences. Here we only assessed the technique of DO. Due to the lack of resources we could not assess whether the students directly visualized the retina. Since this is the first encounter of DO by the students, it was decided to concentrate only on the technique of DO.

We recommend a combined approach with videotapes and live demonstrations to teach DO to medical undergraduates irrespective of their learning styles.

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Comparison of non-contact air puff tonometer readings with Goldmann applanation tonometer IOP readings

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The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 31-34

Introduction

Intraocular pressure measurement is very important practice in ophthalmology as it is important in diagnosis and management of glaucoma. Glaucoma is a progressive optic neuropathy with multiple aetiologies of which intraocular pressure (IOP) is the most important and modifiable risk factor. Glaucoma treatment is mostly concerning reducing IOP and Goldmann applanation tonometry is the gold standard for measuring IOP. Readings are affected by many factors such as central corneal thickness (CCT), corneal curvature and the techniques used for IOP measurement. CCT under estimates IOP in thinner cornea and overestimate in thicker cornea.

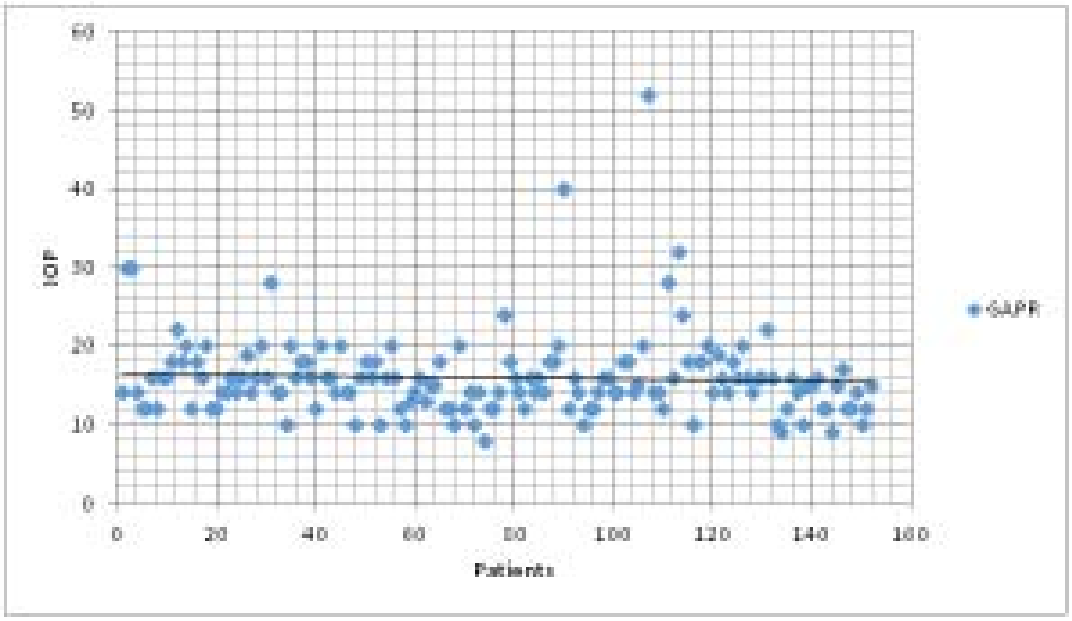
Goldmann Applanation Tonometry (GAT) reading measured in a slit lamp mounted tonometry by a trained personnel. Air Puff Tonometry (APT) is used as an alternating method to check IOP.

Methodology

This is a non interventional cross sectional prospective study conducted at the National Eye Hospital. 152 eyes of 76 subjects attending the outpatient clinics as first visit patients were recruited between 1st to 30th September 2016. APT was measured first between 8 am to 12 noon and GAP measurement was taken within two hours. Consenting randomly selected first time visitors who had first visit OPD numbers attending OPD room 5 between 8am-12pm were included. Patients with corneal problems, such as scars, ulcers, grafts, dystrophy and degenerations, keratoconus, pterigium, ocular infections were excluded.

Results

IOP ranges were from 8 Hgmm to 52 Hgmm in GAP with corresponding airpuff tonometry reading.



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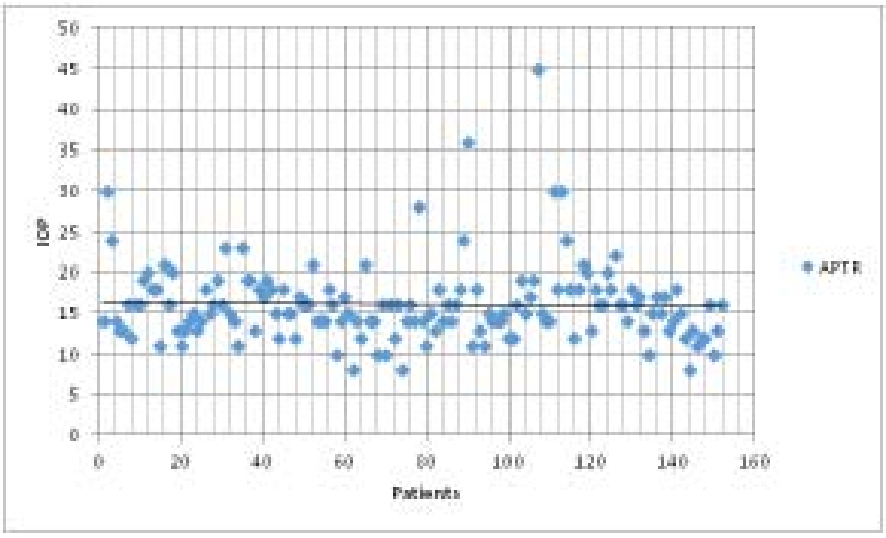
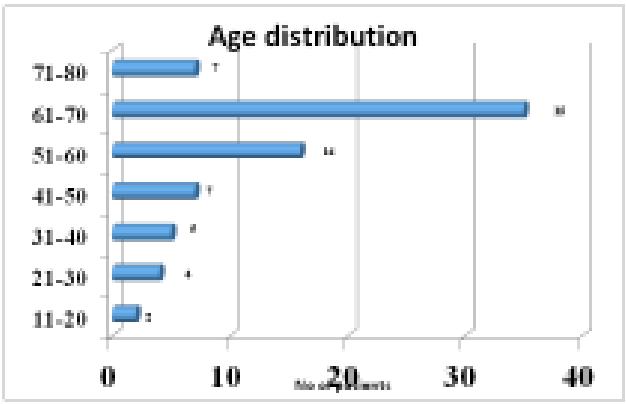
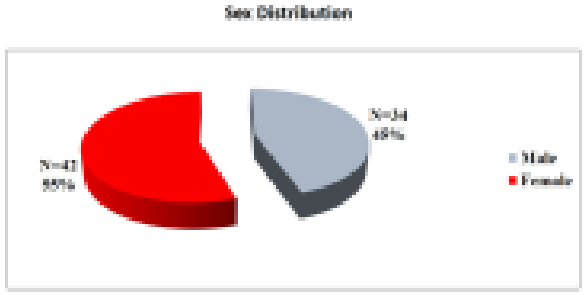


Ages from 10 to 80 year old were in the study with majority were from 61-70 age group. Females were slightly higher.





Comparative air puff tonometry and Goldmann applanation tonometry values:

In total sample...

	APT	GAT
Mean	16.07	15.92
SD	4.85	5.38
SEM	0.39	0.44
N	152	152

P value and statistical significance:
The two-tailed P value equals 0.4436
By conventional criteria, this difference is considered to be not statistically significant.

Confidence interval:
The mean of Group One minus Group Two equals 0.14
95% confidence interval of this difference: From -0.23 to 0.52

Intermediate values used in calculations:
t = 0.7682
df = 151
standard error of difference = 0.188

Eyes with IOP ≤ 20mmHg

	APT	GAT
Mean	14.85	14.71
SD	2.68	2.91
SEM	0.23	0.25
N	136	136

P value and statistical significance:
The two-tailed P value equals 0.4411
By conventional criteria, this difference is considered to be not statistically significant.

Confidence interval:
The mean of Group APTR minus Group GAPR equals 0.14
95% confidence interval of this difference: From -0.22 to 0.50

Intermediate values used in calculations:
t = 0.7726
df = 135
standard error of difference = 0.181

Eyes with IOP >20mmHg

Group	APT	GAT
Mean	26.44	26.25
SD	0.81	9.38
SEM	1.85	2.34
N	16	16

P value and statistical significance:
The two-tailed P value equals 0.4408
By conventional criteria, this difference is considered to be not statistically significant.

Confidence interval:
The mean of Group One minus Group Two equals 0.21
95% confidence interval of this difference: From -0.33 to 0.75

Intermediate values used in calculations:
t = 0.7750
df = 75
standard error of difference = 0.272

Eyes with IOP ≤ 15mmHg

	APT	GAT
Mean	12.99	13.23
SD	1.78	2.29
SEM	0.20	0.26
N	78	78

P value and statistical significance:
The two-tailed P value equals 0.2964
By conventional criteria, this difference is considered to be not statistically significant.

Confidence interval:
The mean of Group One minus Group Two equals -0.24
95% confidence interval of this difference: From -0.70 to 0.22

Intermediate values used in calculations:
t = 1.0514
df = 77
standard error of difference = 0.232

Discussion

Principles of Goldmann Applanation Tonometry (GAT): GAT reading done in a slit lamp mounted tonometry where the patient has to sit in the slit lamp and has to cooperate. Examiner has to be trained to get accurate measurements as the two mires correspond. Anaesthetic agent is used and there is direct contact with tonometry head, which carries the risk of infection and corneal abrasions. GAT measurement of IOP is based on Imbert Fick principle.

Principles of Air Puff Tonometry (APT): APT does not require a cornea touch thus complications are less. Theoretical risk of infection is due to airpuff dispersing tear film and micro aerosol formation. It is easy to learn as the measurement is operator independent as the airpuff is released only when the proper alignment is made. Repeat measures do not reduce IOP due to massage effect. Risk of and cornea damage is less as it is a non-contact method and better for less compliant patients and children. Pressure from air puff deforms cornea and the cornea surface behaving like a reflecting mirror. Reflected light is maximum when cornea is flattest and the time for flattening gives a corresponding IOP measurement. It is a dynamic measurement sensitive to quick fluctuations of IOP due to cardiac and respiratory cycle which may be neutralized by taking an average reading.

There were limitations in this study. Study was done between 8-12 am in morning as it was the morning clinic hours. There was a delay between IOP measurements up to two hours thus diurnal variations can effect IOP measurements.

Tonometry reading are marked every 2 Hgmm in GAP thus human errors in measurement to the closest Hgmm is possible.

Data was not analyzed under sub populations such as glaucoma, vitrectomized eyes etc. Also CCT measurements were not taken due to practical issues.Corneal curvatures, axial lengths and refractive errors can confound IOP measurement which were not excluded by the time the patient was sent for APT.

It is suggested that as APT is an objective, rapid, user friendly, versatile, method to measure intraocular pressure in patients, especially useful in busy clinics. Larger sub categorized study in a bigger population will give more accurate results. With the recourses being limited, there was no true gain, measuring IOP with both the GAT and APT.

Conclusion

- There is no significant difference between the IOP values obtained by APT and GAT irrespective of the numerical value of the IOP reading.
- Despite this, when the APT IOP value is above 15mmHg, the mean readings of APT are some what higher compared to those of GAT values.
- When the APT IOP value is 15 mmHg or less, the APT readings are somewhat lower.
- But when the APT IOP is above 20 mmHg, the gaps between the APT and GAT means are narrower, with APT mean being higher.

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The pupillary illuminator

W. Wijayasiriwardana[1]

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 35-37

Background

The eye is the most important organ of the visual system. It helps visual function by forming images of subjects.

The "Pupil" is a rounded aperture, which situated in the center of the iris and it is involved in controlling the amount of light entering the eye and express various pathological and physiological states. The iris is composed of smooth muscles which are innervated by two types of nerves where the sympathetic innervation dilates the pupil while the parasympathetic innervation constricts it.

So that the pupillary examination is an important component in both ophthalmology and neurology assessments.

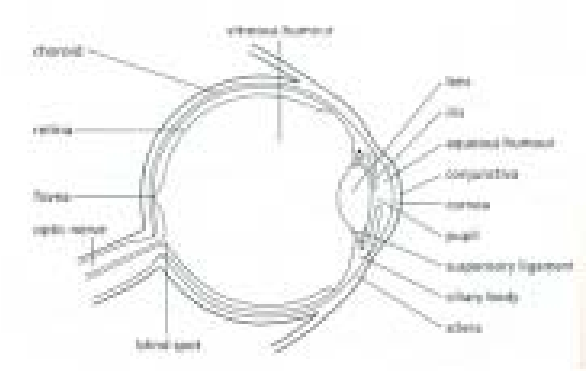

Figure 1. *Major components of the human eye.*

Generally, the puillary examination is divided into several steps for educational purposes. They are...

1. Assessment of pupillary size (anisocoria) and shape
2. Direct pupillary light reaction (constriction)
3. Indirect /consensual pupillary light reaction (constriction)
4. Relative afferent pupillary defect
5. Near response

However, when the iris gets darker, the contrast between the iris and pupil gets less, because the pupil is visible more dark meanwhile iris is darker too. Thus this phenomenon is marked in dark iris eyes than blue iris eyes.

Then it is difficult to assess differences in pupillary size (anisocoria), consensual light reflex and near response. In order to overcome this issue a second light source can be used. It is placed below the nose then this second light illuminate both eyes equally. However this method can have practical difficulties such as:

Firstly, the nose act as a barrier which reduces the illumination of both pupils adequately (Figure 2). Secondly, decentration of this light source can make false pupillary light reactions and interpretations.

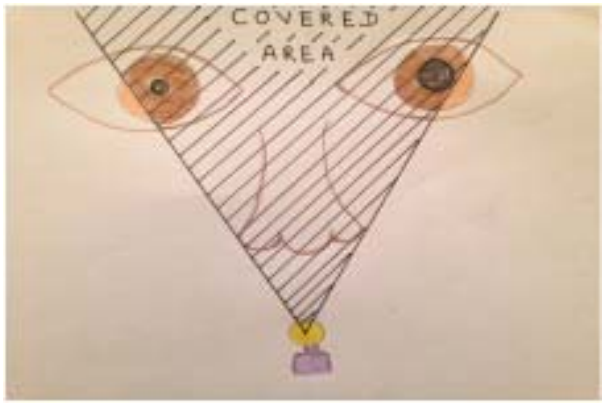

Figure 2. *How the second light source is placed for pupillary examination. It illustrates how barriers (nose) reduce illumination of both pupils adequately.*

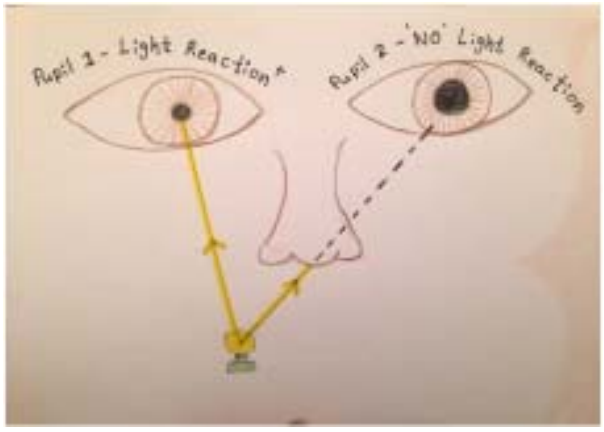

Figure 3. *Prevalence of blindness and visual impairment in Sri Lanka.*

[1]*Senior Registrar, National Eye Hospital, Colombo, Sri Lanka.*

"The Pupilary Illuminator"

The Pupillary Illuminator was designed to overcome the problems which have been discussed above.

It is an electrical circuit with 2 lights, which illuminates both pupils separately at the same time with equal and adequate luminance without interfering with the direct or indirect light reflex.

The circuit

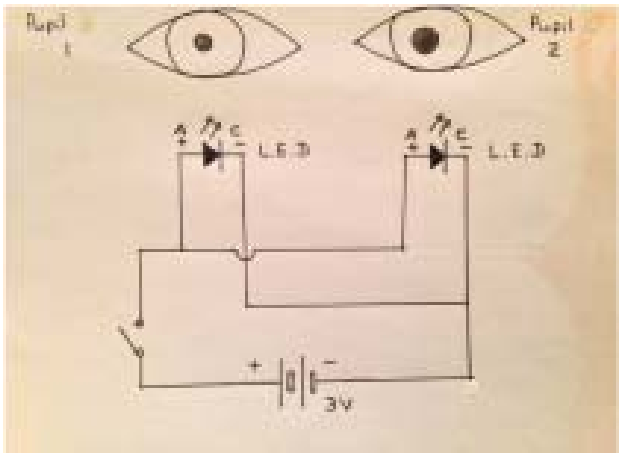

Figure 4. *The electric circuit of the pupillary illuminator.*

Required items

1. Printed Formica board (size of 8 cm x 4 cm)
2. 2 LED lights (white colored)
3. Push button switch
4. Battery case for AAA batteries
5. 2 AAA batteries
6. Wire and lead for fixation

The pupillary illuminator has been made as illustrated here with 2 light sources which were on two ends of the front of the board. The push button switch was fixed to the left corner of the circuit while the battery case was on the central.

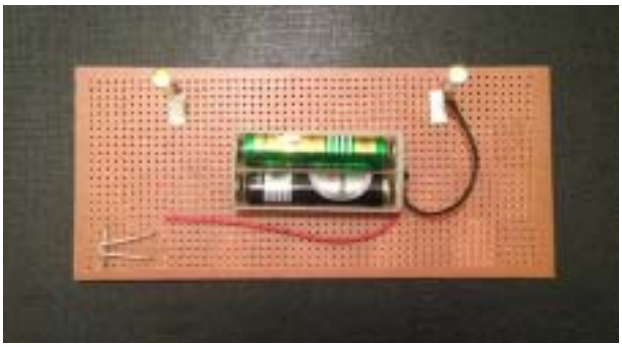

Figure 5. *Finished top view of the pupillary illuminator.*

Advantages

- For a more accurate assessment of both pupils with respect to their size and shape at the same time with an adequate background illumination.
- Simple and easier to use
- Low cost (Production cost about Rs 150 = 1 US$)

How to use the pupilary illuminator

The pupillary illuminator is held just below the tip of the nose with its 2 lights at the same vertical plane of each eye. The examiner can use one hand to turn on the switch of the illuminator and illuminate the both pupils with equal amount of luminance. Then the examiner can use his or her other hand to use another torch light source to obtain the pupillary reactions.

Due to adequate illumination of both pupils by "the pupilary illuminator", when the torch light source is directed at one eye, pupillary reaction of the fellow eye can also be visible clearly.

Figure 6 and 7. *How to use the pupillary illuminator.*

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Fellowship Awards

Presenting, Dr. Mangala Gamage for the honorary fellowship of the College of Ophthalmologists of Sri Lanka

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 38-39

Madam President,

It is a privilege and an honour to present Dr. Mangala Gamage for the conferment of Honorary Fellowship of the College of Ophthalmologists of Sri Lanka.

Dr. Kalyani Mangala Kumari Gamage was educated at Science College Matale, from where she gained university entrance.

She entered the Faculty of Medicine Peradeniya in 1974. She had her basic medical education there and graduated in 1979 having secured a 2nd Class Honours pass.

Her internship was at Teaching Hospital Kandy in 1980 where she did rotations in general medicine and surgery.

Dr. Mangala Gamage stepped her foot on a promising and a more defined discipline, with the year 1983 being of special significance when she started studying Ophthalmology under Dr Mrs. C D Jayaweera Bandara at Teaching Hospital Kandy. Her illustrious career in Ophthalmology commenced with her being successful at the MS part 1 exam in 1984 then Diploma in Ophthalmology and finally MS Ophthalmology in the year 1986.

On completion of post-MD local training her services were made available at the Base Hospital Kuliyapitiya and Teaching Hospital Kurunegala before proceeding for overseas training. She was trained at Moorfields Eye Hospital in London and soon afterwards she obtained the Fellowship of the Royal College of Surgeons of Edinburgh. Dr. Gamage was board certified as a Consultant in Ophthalmology in 1988.

Dr. Mangala Gamage served in Teaching Hospitals Karapitiya, Kandy, Ragama and finally served at the National Eye Hospital Colombo until her retirement from government service in 2015.

During her career, she has held many significant posts. She was the president of Galle Medical Association in 1996 and the President of the College of Ophthal-mologists in 2005. She also served as the Director of the School of Ophthalmic Technologists. These would be only a few from an otherwise very long list.

Dr. Mangala Gamage was very actively involved in both undergraduate and postgraduate education. She took a special interest in Orbit and Oculoplasty, Medical Retina and Community Ophthalmology. She was a member of the Board of Study in Ophthalmology and also has been the Chairperson of the Board for 3 years. She was instrumental in commencing the postgraduate training programme in Orbit and Oculoplasty subspecialty.

Dr. Gamage was the Focal Point for Primary Eye Care in the Vision 2020 programme and was the country coordinator for Prevention of Childhood Blindness Programme and Urban Eye Care project. She has been involved in uplifting primary eye care facilities in Sri Lanka over 30 years and many satellite eye clinics that function today stand witness for this. The outreach cataract camps piloted by her became quite successful, therefore she was invited by the Indonesian government to set up and oversee similar facilities there. A survey on care seeking behaviour of patients was carried out in 2011 and she was also a key investigator in the National Blindness Survey in 2015.

She played a major role in establishing the Paediatric Ophthalmology unit at Lady Ridgeway Childrens' Hospital Colombo which is the pioneer child eye care centre in the country.

Dr. Gamage is presently the joint editor of the journal of the College. She herself has numerous publications to her credit and has delivered many a guest lecture in both local and international conferences.

In 2013 she was presented with the ACOIN award by the Association of Community Ophthalmologists of India for her outstanding work in the Ophthalmic field. She received the Asia Pacific Association of Ophthalmologists (APAO) Distinguished service award in China in 2015.

Hence Madam President, I take great pleasure in presenting to you Dr. Kalyani Mangala Kumari Gamage for the conferment of the Honorary Fellowship of the College of Ophthalmologists of Sri Lanka.

Thank you.

Presenting, Dr. Muditha Kulathunga for the honorary fellowship of the College of Ophthalmologists of Sri Lanka

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 40-41

President, Guests of honour, members of the college, Ladies and Gentlemen,

It is with great pleasure that, I undertake the honour of presenting Dr. Muditha Kamani Kulatunga for the conferment of the honorary fellowship of the College of Ophthalmologists Sri Lanka.

Dr. Muditha Kamani Kulathunga hails from a respectable family from Matara. She was born as the youngest daughter of a family of 5 siblings.

She obtained her primary education from Anula Vidyalaya, Nugegoda and later entered Devi Balika MahaVidyalaya for her secondary education. Having obtained the best results of the college for A/L examination in 1977, she entered Colombo Medical Faculty in 1978. She completed her undergraduate medical training in 1984 with second-class honours.

She completed her internship under the eminent physicians, Dr. M H De Soyza and Dr. M C T Vass of Colombo South Teaching Hospital. She started her career as a fully qualified doctor by becoming the senior house officer toeminent ophthalmologist, Dr. Reggi Semon at the Kandy General Hospital. This triggered her interest in Ophthalmology and in 1986; she successfully sat the MS Part 1 examination and opted to further her training in Ophthalmology. Having passed the diploma in 1988 and obtained MS Ophthalmology in 1990 she preceded to her overseas training. She attended the prestigious King Edward VII hospital in Windsor UK and obtained her FRCS in 1993.

Upon returning to Sri Lanka in 1993, she received her board certification and was appointed as the consultant Ophthalmologist of the General Hospital Kurunegala. For 5 years, she helped to uplift the ophthalmic care facilities in Kurunagala and worked tirelessly to improve the infrastructure of the hospital. In 1998 she started her services at the General Hospital Rathnapura. Though she spent just a couple of years at Rathnapura, her invaluable service is still remembered by the staff of General Hospital Rathnapura. In the year 2000, shewas appointed to the National Eye Hospital of Sri Lanka, which she serves to date.

During her training Dr. Kulathunga had been an exemplary student dedicated to patient care and clinical research. In 1990 she was offered a fellowship in Ophthalmology in Gunma, Japan under Dr. Akira Momose. In 1994 She obtained a WHO Fellowship in Mass Cataract surgery, for which she visited India and Nepal. She was also offered a fellowship in corneal surgery by Madan Mohan Cornea society of India in year 2000.

Dr. Muditha Kulathunga has also done more than her fair shear of training young ophthalmologists of Sri Lanka. Since the year 2000 she continuously trained registrars and senior registrars in her unit and we all fondly remember her teachings. She was the secretary to the Board of Study in Ophthalmology in 2007 and then again from 2012 to 2015. Dr. Muditha Kulatunga has been an examiner for all postgraduate exams from year 2000 to date. Not only in Sri Lanka she was also the External Examiner for the Bangladeshi MD Ophthalmology Examination for two years and has been offered a Honorary fellowship of Bangladeshi College of Surgeons and Physicians.

Her service towards the general public has been immense. She was appointed the focal point in prevention of blindness due to glaucoma under vision 2020 program in 2007 and has been functioning in that capacity to date. Under this program, she has conducted a series of public education programs and screening clinics for glaucoma. She was instrumental in forming the Glaucoma Interest Group of Sri Lanka in 2013 and worked tirelessly to get the affiliation of the group with the world glaucoma association. She is the current chairperson of the same. For the

services she has rendered to the public she was awarded the Most Outstanding Ophthalmologist award for Community Ophthalmology in Prevention of Blindness by the APAO this year.

I would be failing in my duty if I do not mention her commitment to the College of Ophthalmologists of Sri Lanka. She has been an active member of the same for two decades and she worked tirelessly as the secretary to the College for 4 years between 2002 to 2008. She was the president of the College of Ophthalmologists of Sri Lanka in 2009. During this year, the college calendar was filled with academic, community and social activities, which took the college to new heights. She has been an advisor and a council member to the college since then and has been actively contributing to all college activities.

Dr. Muditha Kulathunga is married to a lovely gentleman, Dr. Sunil Kulathunga, a consultant Obstetrician and Gynecologist by profession and they are blessed with two boys, Sahan and Vasika.

Madam President, her contribution to the Ophthalmic services in Sri Lanka has been immense and her trainees have become wonderful ophthalmologists all over the island. In view of all this, I am sure you see how deserving she is of this honor. Ladies and Gentleman it gives me great pleasure in presenting Dr. Muditha Kamani Kulatunga for conferment of the Honorary Fellowship of the College of Ophthalmologists of Sri Lanka.

Presenting, Dr. Charith Fonseka for the honorary fellowship of the College of Ophthalmologists of Sri Lanka

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 42-43

It is a privilege and an honour to present Dr. Hewafonsekage Charith Nilran Fonseka for the conferment of the Honorary Fellowship of the College of Ophthalmologists of Sri Lanka.

Dr. Charith Fonseka had his primary and secondary education at Ananda College Colombo. Having obtained the best results in the Biology stream at his GCE – A level, he entered the Colombo Medical Faculty in 1978 and passed out with second class honours in 1983. He completed his internship in medicine and surgery at the National Hospital of Colombo under Dr. S. Ramachandran and Dr. P. Wijesundara in 1984.

Having set his heart and mind on becoming an Eye Surgeon as a young medical student doing his clinical rotation in Ophthalmology at Eye Hospital, Colombo he became one of the youngest Eye Surgeons in Sri Lanka.

He passed his MS in Ophthalmology in year 1988 and soon thereafter in 1989 the FRCOphth London the only Asian to do so that year. Upon his return to Sri Lanka he was appointed as a Consultant Ophthalmologist at Eye Hospital Colombo in 1990, the post which he holds up to date.

At present he is a Senior Consultant Ophthalmologist and Vitreo Retinal Surgeon at National Eye Hospital, Colombo. He also serves as a visiting Consultant Ophthalmologist to the Military Hospital, Police Hospital and the Navy Hospital. The yeoman service he rendered to those who were injured during the brutal war shows his tireless and dedicated service to the nation.

Despite his heavy workload as a surgeon he dedicates his time and energy to train the post graduates – The future ophthalmologists of the country. Although a strict disciplinarian he is an excellent mentor who instills the love of ophthalmology in addition to imparting his great knowledge of the subject and brilliant surgical skills to his students. He has been a member of the Board of Study in Ophthalmology and has been an examiner and chief examiner for DO/MS/MD ophthalmology examinations. He served as the Secretary of the Board of Study in Ophthalmology from 2008 - 2012 and was appointed as the Chairman Board of Study in Ophthalmology in year 2014, the post which he holds up to date.

Dr. Charith Fonseka was an active council member of the Sri Lanka Medical Council and was a member of the Presidential Task Force in Health Reforms. He also held the post of President and the Secretary of the Government Medical Officers' Association of Sri Lanka.

He was a founder member of the College of Ophthalmologists of Sri Lanka and held the post of secretary of the college in 2001 and has been an active council member to date.

His untiring effort at improving the Vitreo Retinal Services in Sri Lanka – saw the birth of the Association of Vitreo Retina Specialists of Sri Lanka of which he was the founder president in 2011 and 2012.

He was instrumental in establishing the subspecialty of vitreo retinal surgery and also established a well equipped vitreo retinal department at the National Eye Hospital, Colombo.

His interest in cornea led to the setting up of the National Eye Bank of Sri Lanka at the National Eye Hospital in 2011. A generous donation from the Asia Cornea Foundation in Singapore.

He currently holds the positions of Project Director and Medical Director of the National Eye Bank of Sri Lanka. After heaving spear headed the opening of the first branch in Teaching Hospital Kandy he is laying the ground

work for the second branch at Kurunegala. Under his leadership and guidance, The National Eye Bank has gained international recognition and provides super quality corneas to both Sri Lankans as well as foreign patients.

Dr. Charith Fonseka is a member of several prestigious colleges and societies, namely

He is the country representative of the American Society of Retina Specialists (ASRS)

A member of the American Society of Cataract and Refractive Surgeons

A member of the European Society of Retina

For his significant and valuable contributions to ophthalmic development in the Asia Pacific Region he was awarded the APACRS certified educator award in 2008.

He has conducted numerous presentations on phacoemulsification cataract surgery in Sri Lanka, India, China, Myanmar, Pakistan, Indonesia, South Korea, Thailand, Canada and USA and has also conducted studies in clinical IOL evaluation for FDA approval.

He has performed live surgery in China, India, Malaysia, South Korea, Maldives, as well as several international conferences including the American Society of Cataract and Refractive Surgeons (ASCRS) in San Francisco, Asia Pacific Association of Ophthalmology (APAO) in Pakistan and Indonesia, World Ophthalmology Congress (WOC) in Hong Kong and APACRS in Bangkok.

Today the name of Dr. Charith Fonseka is well known across the country, not because of his distinguished career in Ophthalmology, but also because of his contribution towards eye care in Sri Lanka.

I have the pleasure in presenting to you Dr. Hewafonseka Charith Nilran Fonseka an Ophthalmic Surgeon par excellence for the conferment of the honorary fellowship of the College of Ophthalmologists of Sri Lanka.

Presenting, Dr. Dushyantha Wariyapola for the honorary fellowship of the College of Ophthalmologists of Sri Lanka

The Journal of the College of Ophthalmologists of Sri Lanka 2017; 23: 44-45

Madam President, ladies and gentlemen,

It is with pride and pleasure that I present to you, Dr. Dushyantha Wariyapola for the conferment of the Honorary Fellowship, the highest recognition granted by the College of Ophthalmologists of Sri Lanka.

Born as the elder son of Mr. M. B. H. Wariyapola and Mrs. Vajira Balasooriya, he received his primary education at Royal College, Colombo. He excelled in his studies at school and achieved the island's best results at the 1979 'A' levels, in the biological science stream and received the most prestigious Cecil Perera Memorial scholarship, the Dr. U. K. Perera memorial scholarship, the Asoka de Lanerolle prize, as well as the Brooke Bond Scholarship.

He then entered the Faculty of Medicine, University of Colombo and completed his MBBS in 1986 with honors. His impressive undergraduate academic record was lit up with a first class in the 2nd MBBS examination, distinctions in Anatomy, Physiology, Biochemistry and Pathology, the Charmer's gold medal for Anatomy, the N. D. S. Silva scholarship, and also an undergraduate scholarship by the commonwealth Foundation, to follow an elective clinical appointment at St. Mary's Hospital, Paddington, UK.

Dr. Wariyapola stepped into the world of ophthalmology in the year 1989 and obtained the Master of Surgery in Ophthalmology in 1991, winning the 'P A Wirasinha' gold medal for his outstanding performance at the examination. He completed his training at the prestigious 'Tennents Institute of Ophthalmology', Glasgow and obtained the Fellowship of the Royal College of Surgeons of Edinburgh while in the UK.

Dr. Wariyapola returned to Sri Lanka in 1993 and started his career as the first board certified eye surgeon at the General Hospital Ratnapura, and was then successful in joining Sri Jayewardenepura General Hospital in 1995.

Thus began Dr. Wariyapola's committed and unstinted contribution to the progress of the field of Ophthalmology in Sri Lanka.

He started Phacoemulcification surgery for cataracts at SJGH in 1996 and is an expert in complicated phaco-surgery.

Management of retinopathy of prematurity (ROP) is another area Dr. Wariyapola laid the groundwork for, he was the first to publish an article on cryotherapy for ROP in Sri Lanka.

He initiated photodynamic therapy for macular degeneration and is an authority in the country on polypoidal choroido vasculopathy.

Dr. Wariyapola pioneered LASIK and laser vision corrections, DALK as well as DSEK surgeries in Sri Lanka.

His other special interests include glaucoma and medical retina and it is noteworthy that CMV retinitis was reported in Sri Lanka for the first time by him.

In the field of research in ophthalmology in Sri Lanka, Dr. Wariyapola holds an eminent position. There are many local and international publications and presentations to his name.

He has several publications in indexed journals and one such publication is the case report on 'Ocular parastrongyliasis in the vitreous', which was published in the *Journal of Royal Society of Tropical Medicine*, UK.

Many of his publications focus on surgical techniques in phacoemulsification, ROP management, glaucoma, photodynamic therapy for PCV, etc.

Over the past 15 years, he has a host of publications, numbering over 40, in *The Journal of the College of Ophthalmologists of Sri Lanka.*

Dr. Wariyapola was a member of the council of the College of Ophthalmologists of Sri Lanka since 1996, secretary in 2002 and 2004, and was the vice president in 2005. He was appointed the president in 2006, the year in which the eighth SAARC congress was held.

He was the president of the 12th SAARC congress in 2014 and was instrumental in holding this congress in our country.

He was also the 1st chairman of the Glaucoma Interest Group in 2014.

Dr. Wariyapola has been a member of the board of study in ophthalmology of the postgraduate institute of medicine for 16 years. He is a gifted teacher, a dedicated trainer, an exemplary team leader and has been an inspiration and role model to his trainees overall these years.

He was the vice president of the South Asian Society of Ophthalmology (SAO) in 2014 and is the regional representative of Sri Lanka in the Asia Pacific Association of Ophthalmology (APAO).

He is also a member of the American Academy of Ophthalmology, American Society of Cataract and Refractive Surgeons, the Indian Society of Ophthalmology and the Vitreo-retinal Society of India.

Dr. Wariyapola's interests extend beyond ophthalmology. He is an energetic sportsman; involved in cricket, swimming, squash, table tennis and golf, and is an enthusiastic organizer of sports events of the College.

Dr. Wariyapola is the loving husband of Dr. Aruni and the father of two charming daughters, Charindri and Nishendri. Through his wide array of research studies, his dexterity in surgery, his strong leadership qualities and his thorough guidance as a teacher, Dr. Dushyantha Wariyapola has left a deep imprint in his selected field.

Madam President, let me present to you a luminary and a giant pillar in the field of ophthalmology, Dr. Dushyantha Harshin Herath Wariyapola as a candidate for the Honorary Fellowship of the College of Ophthalmologists of Sri Lanka.